Pests

AND THEIR CONTROL

1945

NOVEMBER

VOL. 13 NO. 11

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October 1944 — October 1945

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CONTENTS

"Contributed articles in this publication do not necessarily reflect the opinions of the editors. The editors invite discussions, comments and all types of literary material pertaining to pest control and pests from any person interested in the advancement of the field."

Editorial 4

President's Annual Report Year October, 1944-October, 1945 5
By Theodore Oser

Annual Report of the Secretary Year October, 1944-October, 1945 7
By William O. Buettner

Annual Report of Treasurer 8
By Robert C. Yeager

Unusual Amount of Interest in Labels 9
By Robert E. Wean

Fleas and Plague in English Poetry and Drama 14
By C. R. Twinn

USDA Scientists Awarded John Scott Medal 20

DDT—Toxicology 22
By A. L. Davison

Some Effective Poison Formulas in Rodent (Rats and Mice) Control 24
By Robert M. Borg

Diseases Transmitted From Rats to Man (Abstract) 26
By V. T. Schuhardt

The Use of DDT in the Control of Stored Product Pests 28
By H. E. Gray

Local Organization News 30

What's New in Pest Control—Personals 32

Books 36

Write for These Booklets 38

Additional Patents Relating to Pest Control 41
By Dr. R. C. Roark

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EDITORIAL

Are You a Member?

WE HAVE always been enthusiastic advocates of the trade (or professional) association. We have always believed that men with common interests should get together at regular intervals to review those interests. Right now we see more need than ever for men of common interests to get together.

The transition from a war economy to a peace economy is a job for business brains. The best brains of any business or profession are to be found in its trade association.

But to register its full influence, at a time when that influence is keenly needed, every trade association must also be numerically strong. It must be able to speak for its entire industry or profession.

In the coming months there is going to be the keenest kind of competition in all lines. Legislative proposals, both good and bad, will be numerous. Business will expand rapidly, sometimes along old, familiar lines, and frequently along new and strange lines. There will be labor problems, cost problems, selling problems. These problems can best be solved through discussion in the open forums of trade and professional conventions, through able committee work and through the meeting of minds which is afforded by the trade association.

If you are a member of your trade association, put your best work into it. If you are not a member, now is the time to join.

—From Banker & Tradesman.

The Rights of Rats

IN BRONX Magistrates' Court (N. Y.) this week Magistrate William Klapp imposed a fine of $5 on Charles Colenso, charged by the American Society for the Prevention of Cruelty to Animals with the wrong method of killing rats. Mr. Colenso, apparently a gentleman of sporting tastes, had turned loose in a vacant lot five rats he had trapped, permitting his fox terrier to chase the animals. The dog killed two eight-inch rats but the others escaped.

Magistrate Klapp ruled: "Even a rat is entitled to certain courtesies. If you want to rid the neighborhood of rats you should trap them and drown them and not cause them the anxiety of being chased by a fox terrier." This decision, it may be noticed, leaves out of the question any cats who, throughout feline history, have been causing grave anxiety to rats. It also leaves in full air and vacant lot the exact point when anxiety in a rat can be said to reach the "excessive cruelty" with which the A. S. P. C. A. charged Mr. Colenso. The question is the more difficult because there is not, to date, any Rodent Society for the Prevention of Cruelty to Men.

Such a society might well be desired. For rats remain ferocious, cunning and aggressively destructive. Rats have often bitten sleeping children and have even killed babies. Farmers whose corn and chickens rats persistently destroy have always hunted them and killed them, whether by the teeth of a terrier or any other sufficiently lethal means. So far as man is concerned the rat is a war criminal of long standing. Mr. Colenso's real crime, it will seem to many, is that his "cruelty" allowed three rats to escape, anxiety and all.

—From N. Y. Herald Tribune

The NPCA Meeting

WITH SUCH VITAL postwar subjects as DDT, 1080, Antu, rodent control programs, control specifications and legislation on the agenda of the Cincinnati meeting last month, it would be impossible to single out any one of them as the outstanding one and still do justice to the others.

Not only was it a highly successful meeting but it was also a convincing demonstration of what can be accomplished through co-operation of friendly competitors.

From various committees, task forces, meeting separately and later reporting their recommendations to the meeting at large, to the knowledge advanced by various speakers both from the dais and the floor, co-operation was the vehicle which delivered results.

Theodore Oser, Atlanta, Ga., was re-elected chief executive for another year—incidentally, the first two-time president in the history of the Association. Moreover, officers who have served under President Oser were also held over for a second term. The only change was that Mrs. Lavonne R. Rukin was elected to fill the unexpired term of her late husband, Director Max Rukin.

New Orleans was selected for the next annual convention, with J. Harvey Sturgeon as the convention chairman and Joe Mandlebaum, local chairman.

For their co-operation in contriving a smoothly running and highly constructive meeting and for the warm welcome they afforded the registrants, Robert Yeager and his committee are entitled to a vote of thanks, which, in fact, they received at the meeting.

Cincinnati NPCA Meeting

Complete story of the Cincinnati NPCA Board of Directors meeting will appear in December. This issue, however, contains annual reports of the President, Secretary, and Treasurer read before the meeting.

Death Takes Fish & Wildlife Official

Barry S. Locke, Regional Director of the U. S. Department of the Interior, Fish & Wildlife Service, unexpectedly passed away in his sleep on October 11 at Chicago, where he had planned to work for approximately a year and then retire to Maine, his native state. Sixty years old, especially fond of books and flowers, Mr. Locke had a long and active career in conservation. He is survived by his widow, Mrs. Locke, to whom we extend our condolences.

Please Notice

Should any readers of Pests have more than one copy of the following issues, we would appreciate very much if you will be kind enough to send them to us: January, February, March, May, June, July, 1944; January to September 1945.

We make this request because of such heavy demand for back issues. Thank you.

President's Annual Report October, 1944, October, 1945, By Theodore Oser

Before NPCA Board of Directors Meeting, Cincinnati

October 22

WITH OTHER REPORTS to follow, that will contain the facts and figures of this Association year, I will try to confine this report to a review of some of the highlights and especially to pay tribute to the splendid efforts of its many members who have carried the lion's share of the burdens in making this another memorable year. So many have done so much that many names may not be heard today. There just isn't time to call the roll.

The privilege of serving as your presiding officer at first seems like an herculean task. After a very short space of time, it became a pleasant and satisfactory duty. There was not only the assuring support of the officers and directors but the wise counsel and ever-willing support of the past presidents. Our former presidents have served us nobly and despite the duties of their own businesses. They have volunteered to continue on the present assignments or take on new ones.

The work George Elliott and the Technical Committee have undertaken in producing the PCO Handbook is truly one of the outstanding works in the history of the Association. "Advice to the Buglorn" from Walter McCloud is another contribution from one of our old standbys. A "contribution" in the true sense of the word because, in round figures, it cost Walter about $1,000.00 out of his pocket to cover the initial production costs and there accrued to the treasury of our association a profit of about $1,400.00 through the sale of these booklets. Within the last 30 days, Walter volunteered to serve as co-chairman of the safety committee. The National Safety Council that is developing the safety program in Chicago has its offices at Walter's back door. Because of our unfortunate accident record, serving as co-chairman of this committee will be no small task.

Re-Elected President 1944-45

We have another of these old standbys, Bart Eldredge, a man who has carried on one of the toughest jobs in the Association. The work of Bart and his committee on fumigation will soon receive the recognition that years of hard labor justly deserves. Whether we realize it or not, most, if not all, of our insurance privileges covering fumigation operations are a result of the never-ending effort on the part of our fumigation committee chairman. The key to the reduction of fumigation accidents lies in practicing the principles of the Good Domestic Fumigation Practices. We will either learn to abide by these principles as free men through self-education, or we will practice these principles as men, but by the shackles of legislation. Here, we can again repeat, education is better than legislation.

The research projects committee, under the very able chairmanship of J. Edwin Sameth, has performed no small task. The words most descriptive of the work of this committee can best be quoted from a letter written to Bill Buettner by Dr. P. N. Annand, Chief of the Bureau of Entomology and Plant Quarantine, United States Department of Agriculture. Says Dr. Annand:

"I have your letter of August 25 in which you express appreciation of the assistance of the Bureau in conducting the cooperative research project on DDT. We are very glad to have been of assistance, but the project has not been in any sense one-sided. The Bureau is obtaining a good deal of highly practical information which would be impossible for it to obtain using only its own resources. I wish to compliment you and the National Pest Control Association for the way in which this cooperative research project has been handled. We have received no criticisms for the way in which this work has been operated. Apparently the Association has been able to avoid any suggestion of favoritism as between various members of the industry."

The Rodent Control Committee under the chairmanship of Martin Meyer has also undertaken a difficult task. When this committee turns in its report, it will compare with the very splendid efforts of the Research Project Committee.

In recent months, the legislative committee with a group of about 15 volunteers met in New York for the purpose of reviewing existing legislation and to formulate legislative standards that can be submitted to governmental agencies considering pest control legislation. Men came to New York from several distant areas: Chicago, Detroit, and even Milwaukee was represented in the person of Henry Turrie. There were three days of continuous work and up to the present our Association has yet to see the first bill for any item of expense from any man attending. The results of this meeting are being correlated and will soon be released for our use.

While on the subject of legislation it is not necessary for me to tell you of the ever-increasing trend toward legislation. In January of this year there were 17 states considering legislation. I'll not even try to guess at the number of cities trying to pass legislation covering pest control or some individual phase of our work such as fumigation or rodent control. The wave of rodent control legislation is of such magnitude as to warrant serious consideration to determine the cause.

In the Southern and Southwestern part of the United States there is, of course, the problem of typhus. With

this as the reason for protecting public health, we soon have an ordinance which puts the local health department in the rodent control business. The ordinance not only cover rat-proofing and rat extermination for the control of the disease but in many instances the ordinance provides for a continuous rodent control program. You and I call it "interference with private enterprise" and so it is.

The answer of how to stop competition by government, is the answer as to how it all started. This Association is heartily in favor of any community having an ordinance that would give a health department the necessary inspectional and police powers, to cause a property owner to rat-proof his building and exterminate the rodents. It is our contention, however, that property owner should have the privilege of performing this work with his own labor or employ anyone else he may so desire. A community does not need a typhus condition to start rodent control legislation. We have a number of communities that have no typhus but are thinking in terms of rat-borne diseases as a menace to public health, which constitutes a valid excuse for wanting an ordinance that sets the health department up in competition with private enterprise.

Within the past 12 minths I have attended numerous meetings where rodent control legislation was being considered. Whether the meeting was with the United States Health Service, a State Health Department or local Health Department, the answer, with very few exceptions, was: when your industry does all it should do we will get out of the rat business. In other words, rat-proofing has become a necessary part of our rodent control work. In isolated spots, firms of our industry are doing rat-proofing and a better job of rodent control, but there is not enough being done to satisfy our health departments. If you don't want to do your own rat-proofing, make arrangements with a carpenter or contractor to do it for you; but in any event, our industry must do a better overall rodent control job if we are going to keep Government out of our business.

Legislation is also being passed because of accidents caused by our industry. Accidents don't just happen; they are caused by carelessness. We can not blame any Government agency for wanting to protect the lives and rights of its citizens. Our employees and our customers have a right to live.

During the year we had a safety contest. The overall response was not too encouraging. All because of the apparent lack of interest by many, it became even more evident that a safety program must be formulated. That is now in process under the able chairmanship of Jack Hess and Walter McCloud. Before long you will be receiving material on safety for you and your employees.

I have no sympathy for the attitude of "It can't happen to me." Unfortunately, the records do show that it has happened to some of our very able men. The answer to carelessness is going to be legislation and higher insurance premiums; that is, if we are going to have insurance at all.

During the year there were held four regional PCO conferences, the Southern Conference being resumed after a lapse of two years. While these are not strictly association activities, they are, however, the source of education and inspiration that point toward a goal we are trying to reach,—the goal of professional recognition. It was my pleasure to have attended and participated in all four regional conferences. It was likewise gratifying to have participated in the initial state meetings held in Michigan and Florida, as well as to have visited many other cities where meetings were held.

I have already said that there are many who have done much to make this a successful year and many names can not be called. No president could report to this Association without paying heartfelt tribute, as George Elliott so aptly put it, to the Secretary's office and the young man, Bill Buettner, who conducts that unique institution. More appropriate would be that "Unique young man."

Now that the War is past history and the world is trying to reassemble the pieces, this report could not be complete without at least a partial resume of the representation this Association had in Washington. The cold facts are that the only reason you and I are here today is because your business and mine survived the war,—not only survived, but actually prospered in spite of all of our handicaps.

There may be a few in the room who might have the effrontery to say, "I didn't call on the Association for a thing. I got my men deferred. And I also got the necessary gasoline. All I had to do was go to my ration board."

Now just what did we get as a result of industry representation in Washington? Food ration points for bait; gasoline; tires; the repair parts for our automobiles and other equipment; arsenic, pyrethrum, sodium fluoride, strychnine, paradichloro benzine; even consideration was given for thalum sulphate.

Recognition by the War Manpower Commission.

Recognition by Selective Service.

All of these things with the cooperation of the industry, you and I received because Bill Buettner gave his time and effort to see that we were in that "little black book" in Washington. These are not all the things that kept us in business. There are many more. I can tell you now that DDT was released for service work the early part of August because it was shown that the PCO should be permitted to have DDT. It wasn't because the armed services thought it was time that "John Q. Public" was entitled to DDT; it was released because our industry had a just cause, this cause being ably championed by our Secretary, with the full support of the industry.

The weekly trips to Washington generally meant working at home at night after a full day at the office. Mail would be dictated until time to leave for either the midnight train or the train that leaves the Pennsylvania Station between 3 or 4 in the morning. Either train meant just a few hours sleep at the most, and then a full day at the War Production Board and for good measure several days mail brought along from Brooklyn so that Bill wouldn't get restless during evening hours.

A side light of interest is that while the Association office is 3019 Port Hamilton Parkway, the service letters that "I write so well" are written anywhere but at the Association office. More service letters were "born" between New York and Washington and other out-of-town trips than at 3019 and so it goes with the ever-growing job that has fallen to our Secretary. With the end of the war I thought Bill would get some rest from the daily volume of mail. The correspondence on DDT alone, since its release, would equal all other mail combined for a like period.

For the industry and for myself I say to Bill Buettner, we are deeply grateful for a job well done.

Please Notice

All mail for Pests should now be addressed to our new location—1200 Oak St., Kansas City 6, Mo.

Annual Report Of The Secretary
Year October, 1944 - October, 1945

By WILLIAM O. BUETTNER

Before NPCA Board of Directors Meeting, October 22

REALIZING that the program as arranged will call for more reports than usual, it will be my purpose to be brief, confining myself to statistics and paragraph headings suggestive of the principle activities:

1—**Membership:**

Active	614
Allied	49
Honorary	27
	690

This is the highest membership enrollment in the history of our association representing net paid up membership, after there have been deducted 22, most of whom were suspended because of non-payment of dues. The total of 690 represents a net gain of 30 over the previous "high" reported last year.

2—**Finances**

It is the function of the secretary's office to receive all money which then is promptly turned over to the treasurer, R. C. Yeager. The total receipts for the year amounted to $32,939.33. Vouchers were likewise submitted to the Treasurer that represent disbursements of $29,178.50. The latter disbursements include transfer of $2,744.16 so as to maintain a separate account for "Convention Reserve Fund" and $125.00 to open a separate account for Research Projects. In addition to the above, $1,922.17 was added to the "Convention Reserve Fund". To give an overall summary, there has been added $6,629.99 to our General Fund account of which $1,488.20 is ear-marked for special "Public Relations Activities" by virtue of the profits from the sale of "Advice to the Buglorn."

On behalf of the Buettner family I do want to express our appreciation for the amount of $4,020.42, the amount for the premium on the insurance policy taken out last year.

Since there was much discussion last year with regard to the annual dues paid by the members, we thought it best to submit a recapitulation comparison of the total number of members paying in each bracket.

	1945	1944
$ 15	189*	204*
25	135	120
35	136	106
40	51	40
50	64	43
75	19	14
100	34	26
1500	31 officers	27

*Canadian and Foreign memberships have special rate of $15 so that for 39 members there could only be collected $15.00 which leaves a net of 150 members still paying $15.00 which we feel is a larger number than there should be for this bracket of dues.

3—**Service Letters**

During the year there were issued 34 Service Letters (343-376) consisting of 195 pages. In addition there were 9 Board of Directors letters (12-A-121 inclusive) consisting of 20 pages. Other miscellaneous letters were sent to the industry in several states and cities, consisting of 37 pages.

In addition to the above, the secretary's office had more mimeographing than ever before in connection with the Regional PCO Conferences, supplying many pages that were included in the manuals, and also assisted in providing the pages for the DDT Research Project.

4—**Travelling**

The attached detailed report of 14 trips to attend meetings and 14 trips to Washington, D. C. represent 101 days actually away from the office.

The following trips all of which meant attendance and participation at meetings and conferences that were held. Sixty-five days were consumed during the course of the year on these trips.

1—Amherst, Mass., Nov. 5-6, 1944.
2—Pittsburgh, Pa., Nov. 8-9, 1944.
3—Metuchan, N. J., Nov. 20, 1944.
4—Southern Trip, Nov. 29-Dec. 11, 1944.
Atlanta, Ga.
Birmingham, Ala.
Southern PCO Conference
New Orleans, La.
Austin, Texas
Washington, D. C.
5—AAEE Meetings, New York City, Dec. 13-16, 1944.
6—Purdue PCO Conference, etc., Jan. 12-21, 1945.
Cincinnati, Ohio.
7—Eastern PCO Conference, Feb. 4-7, 1945.
8—Canadian PCO Conference, Feb. 17-23, 1945.
9—Midwest Trip
Buffalo, N. Y.
Detroit, Mich.
Midland, Mich.
East Lansing, Mich.
Jackson, Mich.
Toledo, Ohio
10—Southern Trip, April 25-May 3, 1945.
Washington, D. C.
Gainesville, Fla.
Jacksonville, Fla.
Tallahassee, Fla.
Atlanta, Ga.
Washington, D. C.
11—Boston, Mass., June 4-5, 1945.
12—War Shipping Administration Short Course, July 11-13, 1945.
13—Albany, New York, July 30, 1945.
14—Midwest, Sept. 15-23, 1945.
Minneapolis, Minn.
Chicago, Ill.
Detroit, Mich.

The following represent the trips to Washington, D. C. all of which were in connection with industry matters. Fourteen trips were made which consumed 36 days during the course of the year.

Washington, D. C.
October 4-5, 1944
October 18-19, 1944
November 2-3, 1944
November 15-16, 1944
January 9-10, 1945
January 24-26, 1945
February 13-14, 1945
February 27-28, March 1, 1945
March 13-15, 1945
March 27-29, 1945
May 10-12, 1945
June 13-15, 1945
July 22-24, 1945
August 8-10, 1945

Meetings in the metropolitan New York area were too numerous to mention.

Conservatively it can be said that well over 135 days are taken up on traveling and attendance at the various meetings.

5—The following "headings" are sufficiently suggestive of the major matters which took the remainder of our time—allowance, of course, being made to spend a few days during the year to keep my own business moving—

(a) War Production Board—industry in the limelight.
(b) Technical Problems.
(c) Correspondence and Interviews.
(d) Rodent Control.
(e) Legislation—study of many proposals and assistance given.
(f) Telephone Directory Problems.
(g) Short Courses and State meetings.
(h) Veterans.
(i) Fumigation—Deaths.
(j) Standards.
(k) "Advice to the Buglorn"—correspondence and distribution.
(l) Safety Program.
(m) More visitors to New York than usual.
(n) Assistance given committees.
(o) Postwar Planning—Professional status—Short course.

A casual review of the previous annual reports will show that I seldom mention names of many who participated in the activities of the association. To all who have been so generous in their time and services, not to say anything of the expenses these members incurred out of pocket, I not only express my personal appreciation but the appreciation of the NPCA. I feel satisfied, however, in paying special thanks to my associates, Thomas H. Mahon and Mary P. Hoffman. Only those who have had the privilege of stopping by way of the office in Brooklyn could adequately appraise the valuable services rendered. And finally, our President, Theodore Oser should receive a rising vote of thanks for the services and time-consuming attention given to the business of our NPCA. "Ted" joins the group of Presidents who have unselfishly served the interests of all our Association and can not help making progress when it is our good fortune to have men like "Ted." The traveling the past year has of necessity meant tremendous sacrifices and "Ted" has not failed you and me.

And with this I close another year of service with the annually expressed hope that our NPCA will carry forward the emblematic challenge of the torch of our Association seal—professional structural pest control intent on allowing no refutation to one being professional.

Spray Chemicals and Application Equipment

The new book "Spray Chemicals and Application Equipment" is the result of six years research and collection of data by Wayne B. Fisher, B.S.A., Purdue University, chemical sales representative, and commercial horticulturist, cooperating with Dr. J. A. McClintock, Professor of Horticulture, Purdue University (co-author).

The book "Spray Chemicals and Application Equipment" is divided into two parts. Part one gives the interesting historical background of many chemicals and detailed discussions and photographs showing how they are manufactured. In addition, much discussion is devoted to methods of using spray chemicals, to insects and diseases controlled by the specific chemicals, and to methods of improving present day pest control practices.

Part two is a complete discussion describing almost every type of sprayer and duster available to the public for use in applying spray chemicals. About 300 illustrations are included in this section, and all types of equipment are shown ranging from the simplest atomizer sprayer to the largest commercial sprayers and airplane dusting equipment. Price $4.00 plus 15c postage

Annual Report Of Treasurer

National Pest Control Association, Inc.
Year Ending September 30, 1945

By **ROBERT C. YEAGER**

Before NPCA Board of Directors Meeting, Cincinnati, October 22, 1945.

Balance on hand 9-30-44 in General Fund and Convention Reserve			$14,844.80
RECEIPTS:			
Dues	$22,372.40		
Membership Certificates and Cuts of NPCA	101.00		
"Advice to Buglorn"	4,875.00		
Misc. Publication	104.92		
Contributions	380.00		
From Conv. toward Expenses	3,544.00		
Research Project	75.00		
Misc. Refunds, Service Letters, Refund on R.R. Fare and Withholding Tax	1,487.01		
Total		$32,939.33	
DISBURSEMENTS:			
Service Letters, Inc. Mahon Letter Service, Penny Saver Envelopes, Stencils, Paper, Etc.	$ 3.946.83		
Rent	390.00		
Subscriptions, Dues, Etc.	500.76		
Travelling	4,639.38		
Taxes—Withholding, S. S. and Bank Clearance Costs	275.33		
Gratuities—Floral Pieces, Gifts, Etc.	795.65		
Insurance	4,790.42		
Sec'y & Treas. Sundry Office Expenses including Telephone Telegraph, Postage, Messenger Service, Express, Heat, Etc.	2,986.96		
Sec'y Office Salaries	2,337.00		
Printing and Stationery	684.32		
Regional PCO Conferences	314.91		
Research Funds	160.00		
Convention Reserve Fund (by transfer to provide separate account)	2,744.16		
Public Relation and Promotion	4,320.65		
Student Loan Fund	100.00		
Accounting Service	25.00		
Repairs and Equipment	282.80		
Advertising and Publicity	84.33		
Total		$29,178.50	
Increase in General Fund during year			3,760.83
Balance on hand in General Fund Sept. 30, 1945			$18,605.63

CONVENTION RESERVE FUND

RECEIPTS:			
Transfer from General Fund	$ 2,744.16		
Received from Chicago Conv.	1,922.17	$4,666.33	
DISBURSEMENTS:			
Travelling Expenses for Ftr. Foninier Dr. Sweetman			
Insect specimens for Conf. (Canada)	$ 133.25		
Covers and Labels for Eastern Conf.	25.00		
Toward Eastern Conf.	37.42	195.67	
Balance on hand in Convention Reserve Fund 9-30-45			$ 4,470.66
RESEARCH PROJECT FUND (in Bank Savings Acct.)			$125.00

$750.00 U. S. War Bond (Maturity value $1,000.00) on hand at Secretary's Office.

Unusual Amount Of Interest In Labels

By ROBERT E. WEAN, *Insecticide Division, Geigy Co., Inc., N. Y.*

THE RESEARCH on compositions containing DDT and their subsequent release for civilian use has given rise to unprecedented interest in labels for insecticides. Federal and state officials, as well as the reputable firms manufacturing preparations containing DDT, want the label to be of service to the purchaser. After all, it is the opinion of the buyers which decides whether a product shall increase in volume sales and, other things being equal, results from application render the decision.

The Federal Insecticide Act of 1910 was passed by Congress to fill a need for a law covering interstate shipment of insecticides. To date thirty-three states have enacted various types of laws applying to economic poisons. At the present time a labal for use on a product to be sold in the forty-eight states must meet the provisions of nearly three hundred laws.

The Federal Act does not necessarily require that the percentage of DDT present be disclosed on labels if the product consists entirely of ingredients having insecticidal properties. If a product does contain inert ingredients, then its label shall state the name and percentage amount of each active ingredient together with the total percentage of inerts or in lieu thereof a statement of the name and percentage of each inert ingredient. While some state laws require a statement of and percentage applying to each active ingredient they may or may not apply to household types of preparations. Appreciating the confusion on the labelling situation, Mr. W. G. Reed, Chief of the Federal Insecticide Division, issued on September 1, 1945 the following statement*:

UNITED STATES DEPARTMENT OF AGRICULTURE
Production and Marketing Administration
Washington, 25, D. C.

September 1, 1945

LABELING INSECTICIDES CONTAINING DDT

(Revised)

The term "DDT" refers to the compound 2,2-bis-(parachlorophenyl)-1,1,1-trichloroethane, including both the technical grade of this material, minimum setting point 88°C. and the purified grade. Technical DDT, which is the form of this chemical used for most insecticidal purposes except aerosols, consists primarily of 2,2-bis(parachlorophenyl)-1,1,1-trichloroethane, together with impurities, including considerable amounts of isomers and much smaller amounts of other by-products formed in its manufacture.

When DDT is used as an insecticide, it is mixed or compounded with other materials to make it suitable for application. The forms commonly used are solutions in kerosene, deodorized kerosene, or other mineral oil, to which other insecticides may be added; emulsifiable materials consisting of DDT in an oil solvent, together with an emulsifier, so that emulsions will be formed when they are mixed with water; powders (which may be used as dusts, sprays, or paints) consisting of DDT in an inert carrier, such as pyrophyllite, talc, or clay, and the so-called aerosols, consisting of a propellant such as Freon, DDT, and possibly other insecticides.

Ingredient Statement

Under Section 8 of the Federal Insecticide Act, any insecticide which contains an inert ingredient—that is, one which is not in itself an insecticide—must bear on its label a plain and correct statement of the name and percentage amount of each inert ingredient or, in lieu of this, a plain and correct statement of the name and percentage amount of each of the active ingredients, together with the total percentage of inert ingredients. If the product consists entirely of active ingredients, no ingredient statement is required.

As far as we are now aware, the normal impurities in technical DDT are all active ingredients within the meaning of the act. Mineral oil, such as kerosene, is also an active ingredient for use as a contact insecticide against the common household insects. Therefore, in general, technical DDT and kerosene solutions of DDT are not required to bear an ingredient statement on their labels. No objection is, however, raised to such a statement as "Active Ingredients 100%."

The emulsifiable products may or may not consist entirely of active ingredients, depending upon the solvent and upon the emulsifier used. If both the solvent and the emulsifier are active and the preparation contains no other ingredient, no ingredient statement is required on the label. On the other hand, if the preparation contains an inert ingredient—for example, if the emulsifier is inert or if there is water present—the label must bear an ingredient statement. The carrier in the powders is usually inert and, therefore, the labels for the powders must also bear an ingredient statement.

There is at the present time no practical method for determining all of the different compounds in technical DDT. In view of this, no objection is raised to considering dichloro diphenyl trichloroethane (which includes 2,2-bis(parachlorophenyl)1,1,1-trichloroethane and its isomers) as an active ingredient. For an insecticide containing technical DDT as its only active constituent, either of the following forms of ingredient statement, which should appear prominently on the front panel of the label, will be acceptable:

ACTIVE INGREDIENT
Dichloro diphenyl trichloroethane.....%
INERT INGREDIENTS .....%
Total.....100%

or

(assuming that the technical DDT has a minimum setting point of 88°C.)
ACTIVE INGREDIENT
Dichloro diphenyl trichloroethane.....%
(DDT—setting point 88°C. minimum)

INERT INGREDIENTS .....%
Total.....100%

the correct values to be inserted in the blank spaces. If other active ingredients are present, the ingredient statement in either case should be changed to show the name and percentage of each of them under the heading "ACTIVE INGREDIENTS."

Efficacy Claims

Insecticides containing DDT are known to be effective against a wide variety of insects but they are not effective against all insects and they are different in their action from some of the common household insecticides. Their labels should clearly state the purposes for which they are intended and give clear and adequate directions for use. When necessary, the dosages should be definitely specified. Since different household insects have different habits, the same directions will not be suitable for all uses. The following paragraphs indicate types of directions which will be acceptable:

Flies, Mosquitoes, and Gnats.—As little as 1% of DDT in kerosene is eventually effective as a spray for these insects but it is very slow in action. Because of this sluggish action, products consisting of DDT in kerosene cannot be classified as to grade by the Peet-Grady method. Some other toxicant must be added if quick knockdown is desired. The directions for use should provide for closing all doors and windows and thoroughly spraying the product in all parts of the room, particularly toward the ceiling so as to fill the room with a fine mist. The room should be left closed for 10 or 15 minutes after spraying. No claims for lasting or residual effects should be made for such a treatment.

Insecticides containing DDT can also be used for residual effect. A dosage of 200 milligrams of DDT per square foot will give residual effect up to 3 or 4 months unless removed by weathering, washing, or other means. To obtain such a deposit without

runoff, it is usually considered necessary to apply a 5% concentration in oil or water. The directions should provide for thoroughly treating screens, walls, painted woodwork, light fixtures, and other places where the insects may alight. For flies and other insects attracted to light, it is most important to cover the spaces toward the light. Since some kinds of mosquitoes seek dark places, directions should provide for treating these hiding places. Screens are subject to weathering and, therefore, directions should provide for re-treating them at frequent intervals.

Bedbugs.—Sufficient DDT in the form of an oil solution, as a dust, or in an emulsion will be effective as a contact or as a residual poison for bedbugs. The directions should provide for thoroughly treating bedsteads and mattresses, paying particular attention to all hiding places. If a good treatment is given and the residue is left in place, it may be effective for as long as six months.

Fleas Infesting Premises.—Dusts and oil sprays containing DDT in suitable amounts have been found effective against fleas. Directions should provide for thoroughly spraying or dusting floors, rugs, and other flea-infested places. Under ordinary conditions where the residue is not removed, residual action for several weeks may be expected.

Ants in Buildings.—Oil solutions containing DDT should be sprayed so as to hit as many of the ants as possible and to thoroughly wet their runways and the other places which they frequent. Such treatment should give a residual effect for periods up to several weeks.

Dusts containing DDT have shown value against certain species of ants. They should be recommended for use so as to hit as many ants as possible and to cover their runways and the places they frequent. If a dust is not effective against all sorts of ants infesting households, this should be made clear.

Roaches.—Not less than 8% of DDT in a dust, 5% in an oil solution, or 3% in a water spray should be recommended for these insects. The German roach or waterbug is especially difficult to control with insecticides containing DDT. Instructions should provide for treating cracks and crevics in woodwork, dark places behind pipes, and all places which roaches infest, hitting as many insects as possible. A thorough treatment may give protection for several weeks but in view of the difficulty in controlling these insects, instructions should be given for repeating the treatment whenever reinfestation occurs.

Ticks in Premises (the brown dog tick which is not known to carry disease).—This tick hides in cracks or crevices of kennels or houses, and directions for use against it should be similar to those for use against roaches. Since the engorged tick is quite resistant, a second treatment may be necessary.

Clothes Moths and Carpet Beetles.—The oil sprays containing DDT will kill clothes moths and carpet beetle larvae by contact. Directions for this use should provide for thoroughly spraying the articles to be protected, paying particular attention to folds and seams, as well as spraying the containers in which they are packed. If they are not in tight containers, the treatments should be repeated at monthly intervals.

DDT is also known to have mothproofing properties—that is, residues remaining in the fabric will give lasting effect. Any directions for such use should provide for a thorough contact with the fibers of the articles to be protected. If the DDT will be removed by dry cleaning, by washing, or by other agents, instructions should be included to repeat the treatment after such dry cleaning, washing, or other exposure.

Caution Statements

The Federal Insecticide Act does not require poison labels in insecticides. However, it does require that the labeling of such products shall not be misleading and recommendations for use are considered misleading if they will result in injury to persons or animals involved. Since there is a certain hazard in the use of preparations containing DDT, a caution labeling for them is recommended. The following suggested cautions have been prepared after consultation with authorities on toxicity:

1. **For straight DDT Technical**
   CAUTION: DDT is toxic and when in solution can be absorbed through the skin.
   Avoid inhaling dusts, and mist from spray.
   Avoid contamination of foodstuffs.

2. **For Petroleum Oil Solutions containing not more than 25% DDT Technical**
   CAUTION: This solution if brought into repeated or prolonged contact with skin can cause toxic symptoms.
   Avoid excessive inhalation and skin contact.
   In case of spillage on the skin wash with soap and water.
   Avoid contamination of foodstuffs.
   Do not use on household pets or humans.

3. **For Petroleum Oil Solutions containing more than 25% DDT Technical**
   CAUTION: This solution if brought into contact with skin can cause toxic symptoms.
   Avoid inhalation and skin contact.
   In case of spillage on the skin wash immediately with soap and water.
   Avoid contamination of foodstuffs.
   Do not use on household pets or humans.

4. **For Emulsions containing not more than 25% DDT Technical**
   Same as (2) above.

5. **For Emulsions containing more than 25% DDT Technical**
   Same as (3) above.

6. **For Combustible Mixtures**
   Same as above, and add:
   CAUTION: Do not spray into or near fire or open flame.
   Do not smoke while spraying.

7. **For Dust and Powder Formulations**
   CAUTION: Avoid excessive inhalation.
   Avoid contamination of foodstuffs.

If the preparation contains other hazardous ingredients or solvents, appropriate additional cautions must be added to the foregoing.

It was the opinion of the toxicologists that the white household powders and dusts should be colored. This recommendation for coloration is made solely for the protection of human life, but does not conclude that the product is highly toxic to man to the extent that it requires a poison label with skull and crossbones.

Statements Concerning DDT Content

In view of the great publicity that has been given DDT, there is a tendency to overemphasize references to DDT on the label, as by using it in the name or by printing it in such large letters as to overshadow other reading matter on the label. Such names as "DDT Spray," "DDT Powder," or "Doe's DDT Insecticide" are not acceptable. It is a general rule of labeling that if a name is to be descriptive, it must be completely descriptive. A product containing 5% of DDT in kerosene is not a "DDT Spray" but is a Kerosene and DDT Spray." A 10% mixture of DDT in clay would be a "Clay and DDT Powder" rather than a "DDT Powder."

If a preparation contains DDT in sufficient amount to be effective against all of the insects named on the label, no objection is raised to a statement that it "Contains DDT," provided the word "Contains" is in the same sized type and equally as prominent as the term "DDT" and that they are not more prominent than the name of the product.

Some preparations are being made by merely adding DDT in small amounts to another insecticide, the DDT being present in too small an amount to be effective against some or all of the insects named. An unmodified statement that the product contains DDT would give the misleading impression that it contains sufficient DDT to be effective against all of the insects named. To avoid such a misleading impression, the label in this case should definitely state the amount of DDT present, if any reference to it is made,—as, for example, by stating "Contains .....% DDT," the current value being inserted in the blank space.

Other Insecticidal Uses of DDT

Insecticides containing DDT are of value for many agricultural and other insecticidal purposes. Directions for such uses are not discussed in this trade notice because they have not yet been sufficiently developed. There is, of course, no objection to marketing DDT preparations for other uses for which they are known to be effective, provided they are properly labeled.

(Signed) W. G. Reed,
Chief, Insecticide Division, Livestock Branch.

Statement of attached six pages.

The following type labels have been prepared as a means of illustrating statements which may appear on labels for DDT compositions as well as giving their appropriate positions.

(a) For contact or space spray containing 1-2% DDT and all ingredients having insecticidal properties:

Exhibit A

(b) A type label when amount of DDT present is stated by manufacturer and given prominence on the label. Further, the claims apply to a residual type spray.

FUMIGATION NEWS

NOVEMBER *Published in the interest of Pest Control Operators and the use of*
AERO BRAND HCN DISCOIDS AND CYANOGAS
by Insecticide Department of
American Cyanamid & Chemical Corporation
Kansas City 6, Mo. 30 Rockefeller Plaza, New York 20, N. Y. Azusa, Calif.
1945

ABBOT PEST CONTROL CO. SOLVES "HOME VERMIN PROBLEMS" WITH CYANOGAS AND HCN DISCOIDS

NEW HAVEN, CONN.—The Abbot Pest Control Co., which operates both on individual and contract jobs to eliminate pests from apartment houses, institutions, factories, stores and warehouses, has built a thriving and successful business since its start in 1935 as a specialist in pest control operations.

Walker R. Heap, executive of the company, says, "*Our experience with AERO* BRAND HCN DISCOIDS has been very successful. Under proper conditions and with proper handling, there is no reason why the average fumigator should not receive a 100 per cent kill, particularly on bedbugs. HCN Discoids are also clean and easy to handle.*"

He continues, to say, "*Our experience with CYANOGAS* has also been very gratifying. It is most effective on both rats and ants. Not long ago, with 6 ounces of CYANOGAS in an 8-ounce rubber bulb, we accounted for 24 rats by count.*"

The Abbot Pest Control Co. is a member of the National Pest Control Association and has shown steady growth as a leader in the field during the past ten years.

16 OZ. DISCOIDS AGAIN AVAILABLE

Limited production has been started on 16 oz. HCN DISCOIDS, packed 48 cans to the case. It is, of course, to the PCO's advantage to use 40 oz. cans wherever possible, but the 16 oz. cans are again available for jobs where they are really needed.

WIRE MESH TRAYS FOR SPREADING DISCOIDS

Discoids should not be brought in direct contact with floors or carpets as there is sometimes a possibility of staining. Some pest control operators spread the Discoids on several thicknesses of newspaper, while others use squares (approximately three feet) of corrugated paper upon which to scatter the Discoids. The sheets are light in weight making it easy to distribute them as well as to gather them up after the fumigation and the corrugations promote evolution of gas from the discs.

However, it is reported that an increasing number of fumigators prefer to use wire baskets or wire mesh trays. Before the war, suitable wire baskets were obtainable in most household and department stores. They were of the "dish drain" type and sold for around twenty-five cents each. They measured approximately twelve inches by eighteen inches and had short legs which kept the basket clear of the floor. Using these, all the PCO has to do is to shake the Discoids out of the can into the baskets, and since they are raised off the floor, that permits circulation of air, resulting in quicker diffusion and distribution of the gas.

FUMIGATION PROSPECTS
Wholesale Grocers

Wholesale grocery concerns and other handlers of food products are continually troubled with rats and mice. Frequently large stocks become insect-infested. Sometimes it is possible to fumigate the infested material in a separate room, sealed off for the purpose. However, where there is a great deal of infested material, it may be necessary to fumigate the entire building.

It will pay you to solicit these concerns regularly. Why not make up a list and plan a systematic series of calls and follow-ups on this trade.

LET CYANOGAS HELP SELL AND SATISFY YOUR CUSTOMERS

Your most important selling point in securing any pest control job is the effectiveness of the material you intend to use. Where CYANOGAS can accomplish the job, you have the best selling point in the world because CYANOGAS IS "THE GAS THAT KILLS 'EM!"

Rats in burrows are quickly and surely exterminated by forcing CYANOGAS A-DUST into burrows with a foot pump or suitable duster. When this powder is forced into burrows, HCN gas is formed and all rats, old and young, as well as any fleas with which they may be infested, are killed almost instantly. CYANOGAS is easy to apply, means a minimum of time necessary to complete an operation.

CYANOGAS G-FUMIGANT can be used on small jobs, (except dwellings where the use of HCN DISCOIDS is recommended) for fumigating indoors for controlling rats, mice, and insects found in mills, warehouses, tourist camps, bunk cars, and similar buildings. Give yourself the advantage which CYANOGAS effectiveness provides in Pest Control operations.

For more information on fumigation with AERO BRAND HCN DISCOIDS and CYANOGAS, write for free manuals.

*Reg. U. S. Pat. Off.

Exhibit B

(c) A complete ingredient statement with no inerts present. Same as (a) or (b) in other respects depending upon claims which can be made.

ACTIVE INGREDIENTS:

Dichloro-diphenyl-trichloroethane	XX%
(Knockdown toxicant)	XX%
Petroleum hydrocarbon distillate	XX%
Total	100%

Suggestions for Labels of Household Sprays Containing DDT
Front Panel

(Net Contents) (Name of product) (Net Contents)

ACTIVE INGREDIENTS 100%

(If DDT is mentioned on this label its percentage must be given)

DO NOT USE ON PLANTS

Kills Flies and Mosquitoes, Gnats, Clothes Moths, Cockroaches and Bedbugs.

This is a finished product and ready for use without dilution. It is to be applied as a contact or space spray, whereby insects in the room will be hit. The insects coming in contact with the spray will rapidly drop to the floor and die. Best results will be secured through thorough application of the spray into the atmosphere and on insects visible at time of application. Be sure windows and doors are closed before spraying and keep them closed for 10-15 minutes after treatment.

For roaches spray all hiding places, hit as many as possible and repeat when necessary. For moths spray all surfaces of fabrics as well as containers and repeat once a month unless in moth-tight storage. For bedbugs thoroughly spray dismantled bed, mattress and all hiding places about the room. Repeat when necessary.

U. S. Patent No. 2, 329, 074
Manufactured by

(Name) .....

(Address) .....

Back Panel
CAUTION

This solution if brought into repeated or prolonged contact with skin can cause toxic symptoms. Avoid excessive inhalation and skin contact.

In case of spillage on the skin wash with soap and water.
Avoid contamination of foodstuffs.
Do not use on household pets or humans.
— Combustible Mixture —
Do not spray into or near fire or open flame.
Do not smoke while spraying.

Suggestions for Labels of Household Sprays Containing DDT
Front Panel

(Net Contents) (Name of product) (Net Contents)

CONTAINS 5% DDT
ACTIVE INGREDIENTS 100%
DO NOT USE ON PLANTS

Kills Flies, Mosquitoes, Bedbugs, Fleas, Silverfish, Clothes Moths, Carpet Beetles, Cockroaches, and Fowl Ticks.

This is a finished product and ready for use without dilution. It will give a residual deposit of DDT whereby toxicity to insects will be prolonged over a period of time. It is important to thoroughly spray the surfaces over which the insects crawl or upon which they rest. Use, if possible, a sprayer giving a coarse, droplet type deposit, rather than delivering a fine mist.

U. S. Patent No. 2, 329, 074
Manufactured by

(Name) .....

(Address) .....

Back Panel
USES

Flies and Mosquitoes: Thoroughly spray screens, walls, ceilings, beams, and other resting places for the insects. Repeat as necessary, depending upon insect population.

Bedbugs: Thoroughly spray seams and tufts of mattresses, dismantled bed, slats and springs of beds, baseboards and moldings, behind loose wall paper and cracks and crevices of infested areas.

Fleas in Buildings: Destroy infestations by spraying in basements, the floors and walls of living quarters, and beneath and on rugs and other floor coverings.

Silver Fish: Apply spray thoroughly to infested areas, particularly behind loose wall paper and in other breeding places.

Cloths Moths and Carpet Beetles: Adults and larvae killed by contact with spray and reinfestation of clothing and furniture prevented through residual effect of DDT. For moths same directions as on label A and as a residual spray. Thoroughly treat fabric to be protected and repeat after each cleaning.

Cockroaches: The hiding places and runways should be thoroughly sprayed paying particular attention to cracks and crevices, around cupboards and baseboards. Repeat when reinfestation occurs.

Fowl Ticks: First remove and destroy old litter and nesting materials from the poultry house before making application Thoroughly spray walls, floors, and ceilings. Pay particular attention to cracks and crevices, roosts, and behind and beneath nesting boxes and other pieces of equipment.

CAUTION

This solution if brought into repeated or prolonged contact with skin can cause toxic symptoms. Avoid excessive inhalation and skin contact.

In case of spillage on the skin wash with soap and water.
Avoid contamination of foodstuffs.
Do not use on household pets or humans.
— Combustible Mixture —
Do not spray into or near fire or open flame.
Do not smoke while spraying.

(d) A label for a dust or wettable product containing DDT together with inert carriers.

ACTIVE INGREDIENT	
Dichloro-diphenyl-trichloroethane	10%
INERT INGREDIENTS	90%
Total	100%

CAUTION

Avoid excessive inhalation.
Avoid contamination of foodstuffs.

Under directions for use might be given procedure to follow for control of the following insects: cockroaches, silver fish, bedbugs, carpet beetles and clothes moths, fleas and cattle lice.

*Reed, W. G. Labeling Insecticides Containing DDT. (Revised) U.S.D.A. Production and Marketing Administration. Sept. 1, 1945.

RESEARCH

The acute and chronic toxicity of alphanaphthylthiourea (ANTU) was studied in albino rats, rabbits, cats, and dogs, with the following results:

1. The acute toxicity of ANTU varies in different animal species, rats and dogs being the most susceptible and rabbits the least.

2. Pleural, and to a lesser extent pericardial, effusions are characteristically present in all species if death is not delayed much beyond 24 hours.

3. The effusions have a protein content usually over one-half that of the plasma.

4. Tolerance to the acute toxicity of ANTU can be induced in rats by administering progressively increasing doses at 3- to 4-day intervals. No effusions have been found in tolerant rats dying from large doses.

5. Chronic toxicity experiments in rabbits and cats indicate a cumulative action.

6. In chronically poisoned cats effusions are absent, but instead bilirubinemia is regularly produced, and this seems to be the result of altered capillary permeability with leakage of bile from the bile channels into the venous sinusoids.

By Wm. T. McCloskey, Pharmacologist, and M. I. Smith, Chief Pharmacologist, United States Public Health Service, Public Health Reports, Vol. 60, Sept. 21, 1945, No. 38.

PRENTISS PRODUCTS for PEST CONTROL

Available now:

PRENTISS 30% DDT CONCENTRATE

a Concentrated liquid Insecticide containing 30% Technical DDT by weight.

PRENTISS No. 10 CONCENTRATE

a 50% solution of Dichloro-Diphenyl-Trichloroethane isomers in a special solvent for production of residual sprays for bedbug, fly and mosquito control.

Also

Pyrethrum Concentrates
Pyrethrum Powders
Rotenone Products
Fortified Red Squill Powder and Liquid
DDT Concentrates

R. J. PRENTISS & CO.

110 WILLIAM STREET, NEW YORK 7, N. Y. — 9 SO. CLINTON ST., CHICAGO 6, ILL.

Fleas and Plague in English Poetry and Drama*

By C. R. TWINN, *Ottawa. Ont.*

"A poet's song can memorize a flea;
The subtle fancy of deep-witted Donne
The wee phlebotomist descanted on . . .
Pasquier, the gravest joker of the age,
Berhymed LaPuce in many a polished page."
—Coleridge.

ACCORDING TO ESSIG (3) the word "flea" was derived from the Middle English fle, flee; the Anglo-Saxon flea, fleah; the Danish vloo; German floh, all descriptive of the insect's ability to flee or run away. This elusiveness is made possible by the small size, the hard, smooth, laterally compressed body, and the long powerful legs fitted for leaping.

The eggs of fleas are laid on the bodies of their hosts, from which they fall to the floor and hatch into tiny larvae. These whitish, active grubs, which measure hardly more than one-sixth of an inch when full-grown, feed on organic matter in floor cracks and similar places. On reaching maturity the larvae spin cocoons in which transformation to the adult form takes place, and from which after varying periods the hungry fleas emerge. From this brief outline it is obvious that fleas are most likely to be abundant where there is a lack of cleanliness. Because of this, fleas were a much greater problem in temperate countries before cleanliness became popular and efficient sanitary measures were developed than they are today.

Fleas probably have always been very prevalent in the Middle East, but they appear to be mentioned only twice in the Bible, indicating, perhaps, that the patient Hebrews were too accustomed to their obnoxious presence to think them worthy of note in their writings. The insignificance and elusiveness of the flea is stressed in these references. David says, referring to Saul:

"After whom is the king of Israel come out? After whom dost thou pursue? After a dead dog, after a flea?" (*I Samuel* 24:14), *and again: "Now therefore, let not my blood fall to the earth before the face of the Lord; for the king of Israel is come out to seek a flea, as when one doth hunt a partridge in the mountains"* (*I Samuel* 26:20).

Undoubtedly, Chaucer was familiar with these tiny but formidable pests in fourteenth century England, as is revealed by the following extract from **The Maunciple's Tale:**

"'Awake thou cook,' quod he, 'god yeve thee sorwe,
What eyleth thee to slepe by the morwe?
Hastow had fleen al night, or artow dronke,
Or hastow with some quene al night y-swonke,
So that thou mayst nat holden up thyn heed?'"

In the century which followed, John Skelton indicated clearly in his poem **Phyllype Sparowe,** that fleas not only were common but were taken as a matter of course by people generally. Philip, the sparrow referred to in the poem belonged to the fair Jane Scroupe:

"For it wolde come and go
And fly so to and fro
And on me it wolde lepe
When I was aslepe
And his fethers shake
Wherewith he wolde make
Me often for to wake
And for to take him in
Upon my naked skyn;
"Phillyp wolde seke and take
All the flees blake
That he coulde there espye
With his wanton eye."

Fleas were also common in Elizabethan England and were mentioned both by Marlowe and Shakespeare in their plays. For instance, in Marlowe's **Doctor Faustus** (Scene 4), when Wagner, servant to Faustus, promised the Clown that if he would serve Faustus he would teach him to turn himself into a dog, cat, mouse, rat, or anything, the Clown replied:

"If you turn me into anything, let it be in the likeness of a little pretty frisking flea, that I may be here and there and everywhere. Oh, I'll tickle the pretty wenches' plackets; I'll be amongst them i' faith."

In Shakespeare's **Merry Wives** (IV. 2), when Mistress Ford's jealous husband was searching the laundry basket for a man, she, knowing no one was there, said boldly: "If you find a man there, he shall die a flea's death". Angry Petruchio, in **The Taming of the Shrew** (IV. 3), had the annoying qualities of the flea in mind when he called the impudent tailor, "Thou flea, thou nit, thou winter-cricket thou!"

In **Twelfth Night** (III. 2), Sir Toby Belch graphically indicates the cowardly nature of Sir Andrew Aguecheek by remarking to the servant Fabian, that if Sir Andrew:

"were opened, and you find so much blood in his liver as will clog the foot of a flea, I'll eat the rest of the anatomy."

The inn at Rochester referred to in Part I of **King Henry IV** (II. 1) must have been flea-ridden indeed, to warrant this description by the two carriers:

Sec. Car.—"I think this be the most villainous house in all London road for fleas: I am stung like a tench."

First Car.—"Like a tench! By the mass, there is ne'er a king in Christendom could be better bit than I have been since the first cock."

Sec. Car.—"Why, they will allow us ne'er a jordan, and then we leak in your chimney; and your chamberlie breeds fleas like a loach."

In these words put into the mouths of his characters, Shakespeare indicates the widespread abundance of fleas, even royalty being afflicted, and associates their occurrence with the presence of filth. In explanation it should be pointed out that a "jordan" is a chamber pot, "chamberlie" is urine, and a "loach" is a small species of fish.

There are two other references in Shakespeare's plays which illustrate that fleas were a common and familiar affliction in his day. In **King Henry V** (II. 3), the boy, speaking of Falstaff, says: "Do you not remember, 'a saw a flea stick upon Bardolph's nose, and 'a said it was a black soul burning in hell-fire?" Evidently, Bardolph's nose had the red glow of a heavy drinker. In the same play (III. 7), the Duke of Orleans, in reply to a remark by Lord Rambures that "That island of England breeds very valiant creatures", says: "You may as well say, that's a valiant flea that dare eat his breakfast on the lip of a lion." In other words, the invading English had not the wit to understand the danger they were incurring.

Donne, a contemporary of Shakespeare, wrote a poem to "The Flea". The flea bit a man and a woman, following which the latter killed the flea. Then said he to her:

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"Yet thou triumph'st, and say'st that thou
Find'st not thyself nor me the weaker now.
'Tis true; then learn how false fears be;
Just so much honour, when thou yield'st to me,
Will waste, as this flea's death took life from thee."

In Donne's time, the deadly role of the flea as the carrier of bubonic plague was quite unsuspected, as shown in the statement in the twelfth stanza of his poem **Devotions,** that "The flea, though he kill none, he does all the harm he can". In fact, the flea was looked upon merely as a rather troublesome pest. To say with Fletcher **(Love's Cure,** Act III, Sc. 3) that a person "went away with a flea in his ear" means only that he went away annoyed.

In his satirical poem **Hudibras,** Butler endowed one of his characters with the knowledge of:

"How many scores a flea will jump,
Of his own length, from head to rump,
Which Socrates and Chaerophon
In vain assayed so long agone;
Whether his snout a perfect nose is
And not an elephant's proboscis."

In the seventeenth century, when Butler wrote this, experimental entomology was hardly thought of, so it is unlikely that anyone really knew how far a flea could jump. In more recent times the matter has been investigated, and Mitzmain (5) reports that the human flea's jump may reach horizontally thirteen inches and vertically to a height of almost eight inches. A large flea would measure about one-eighth of an inch, so a forward leap of thirteen inches would carry it a distance exceeding 100 times its own length, a prodigious jump indeed!

Up to the early seventeenth century microscopes were of primitive and simple construction and magnified objects only about ten times. This was enough, however, to excite popular interest in tiny living things. According to Nordenskiold (6) it was considered especially fascinating at that time thus to observe fleas, with the result that the earliest type of microscope received the name of **vitrum pulicare,** or flea glass.

Nearly everyone has read or heard, in one form or another, the idea expressed in these lines from Jonathan Swift's **Rhapsody:**

"So, naturalists observe, a flea
Has smaller fleas that on him prey;
And these have smaller still to bite 'em;
And so proceed ad infinitum."

Thus succinctly is expressed a profound truth which is the basis of modern efforts to establish the biological control of many important insect pests. The "smaller fleas that on him prey", however, may not always be beneficial from the human point of view, as they sometimes assume the form of malignant microorganisms that may be conveyed to man. The bacteria known as **Pasteurella pestis,** which cause the infamous bubonic plague or "Black Death" are transmitted to humans by fleas.

The true nature of the plague or Black Death has been known for only half a century. The causative organism was first isolated in 1894, and in 1906-7 its dissemination by fleas was fully demonstrated in India by the British Plague Commission. Little did the millions of unfortunate victims of the disease during past centuries suspect the vermin by which they were surrounded. Actually, it is primarily a disease of rodents. The fleas which feed on them become infected and when their host dies they leave it and attack other animals, including man, who in turn contracts the disease.

Wells, in "The Outline of History", gives a brief summary of the more important outbreaks of plague in the world and the great effect they had on social conditions. These outbreaks occurred intermittently throughout the centuries down to quite recent times, and the danger still persists. Between the year 164 and 180 A.D. a great plague swept through the Roman Empire of Marcus Aurelius, and also through China, slaying millions and disorganizing society. Wells states that pestilences were recorded in England by Bede in 664, 672, 678, and 683; four outbreaks in twenty years! The most violent visitation, however, occurred about the middle of the fourteenth century, and was appropriately named the Black Death. It swept over a large part of Europe, Asia and Africa, and in a period when populations were very much smaller than they are today, brought death to an estimated twenty-five million people in Europe, and thirteen million in China.

A vivid eye-witness description of the ravages of the plague in Florence in 1348 was written by Boccacio. This same year the pestilence reached England. General living conditions in the England of the Middle Ages were ideal for spreading the plague. Finnemore (4) states of the period: "Houses were very dirty; the surroundings filthy. The dunghill stood near the door. The houses of the poorer classes were mere huts. . . . The floor was of hard-trodden earth. . . . " And one might add that people were generally careless in disposing of animal matter and garbage, so that rats were abundant, and everybody kept dogs which were full of fleas, and the people themselves in their dirty surroundings were thoroughly fleabitten. So the fleas carried the plague from rat to rat and from rats to humans, and the Black Death swept like a devastating fire through the land and is reported to have destroyed nearly one-half of the four million inhabitants. Large tracts of country-side were denuded of their populations; many villages were left deserted and silent, and life in the towns and cities was dreadfully depleted and thoroughly disorganized; two-thirds of the students at Oxford are said to have died. The immediate result of this devastation was a great shortage of labour, and the inception or acceleration of social changes. The free workers demanded and received higher wages and moved about from one locality to another to better their lot. Many serfs obtained their freedom by fleeing to the towns where, after being concealed for a year and a day, they became freemen under the law. On the other hand it was the labour shortage which brought about the imposition of unjust laws which in turn led to the Peasants' Revolt under Wat Tyler in 1381.

In the words of Finnemore:

"Thus, within half a century after the Black Death the serfs were freed from their bondage to the land, the labourer had asserted his right to a fair day's wage for a fair day's work, the tenant farmer had made his appearance, and the whole constitution of English society had changed. The fourteenth century is one of the most striking in our history. It saw the great French wars; it saw Crecy and Poitiers; but assuredly it saw nothing more important or more far-reaching in its effects than the Black Death."

Intermittent outbreaks of plague occurred in England from the fourteenth to the end of the seventeenth century. It was an ever present and terrifying menace. Naturally there are numerous references to it in the works of the poets who lived during those centuries. Chaucer, who was a boy at the time of the 1348 outbreak, mentions the pestilence at least fourteen times. The following lines from the **Pardoner's Tale** almost certainly relate to the Black Death:

"'Ther com a prive thef, men clepen Deth,
That in this contre al the peple sleth;
And with his spere he smot his hert a-two,
And went his way withoute wordes mo.
He hath a thousand slayn this pestilence.'

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"'By seinte Mary!' sayde this taverner,
'The child saith soth; for he hath slayn this year,
Hens over a myle, withinne a gret village,
Bothe man and womman, child, and hyne, and page;
I trowe his habitacioun be there.'"

Spenser, in the **Faerie Queene** (Bk. 3, C. 3) speaks of "plagues and murrins pestilent" which consume Britons, forming "huge hills of dying people . . . til lall their warlike puissance" is spent. Further, in **Prosopopoia** (7-12) he states that the "hot Syrian Dog . . .

Corrupted had th' ayre with his noysome breath
And powr'd on th' earth plague, pestilence, and death.
Emongst th' rest a wicked maladie
Raign'd emongst men, that manie did to die,
Depriv'd of sense and ordinarie reason:
That it to leaches seemed strange and geason."

According to Bartlett's Concordance there are 94 references to "plague" and 13 to "pestilence" in the works of Shakespeare. The former word is most frequently used in the sense of "A Plague upon him (he or it, etc.) !", "A plague upon such backing!", "The very devils cannot plague them better", "A plague of sighing and grief!", etc. However, several refer directly to the disease, of which the following are examples:

King Henry, in **Henry V** (IV. 3.101), when asked to surrender to the French by the Constable of France, refused, and sent word to the latter, that even those of his soldiers who were slain in battle and buried in French soil would:

"be famed; for there the sun shall greet them, and draw their honours reeking up to heaven; leaving their earthly parts to choke your clime, the smell whereof shall breed a plague in France. Mark then abounding valour in our English; that being dead, like to bullet's grazing, break out into a second course of mischief, killing in relapse of mortality."

In these words Shakespeare expressed a popular belief that plague was caused by exhalations from decaying matter, with no thought of the fleas. The mysterious nature of the spread of infection is also indicated in **Twelfth Night** (I. 5.314), when Olivia says:

"How now! Even so quickly may one catch the plague? Methinks I feel this youth's perfections with an invisible and subtle stealth to creep in at mine eyes."

The horrid bubos characteristic of bubonic plague are referred to in this line from **Lear** (II. 4.227):

"Thou are a boil, a plague-sore, an embossed carbuncle, in my corrupted blood."

There are several other equally significant passages in Shakespeare's works.

The impartial manner in which the plague struck down rich and poor alike is indicated in the following stanza from a poem by Thomas Nashe, a contemporary of Shakespeare, entitled **In Time of Pestilence.** Each verse ends in a pitiful cry to God for mercy:

"Rich men, trust not in wealth,
Gold cannot buy you health,
Physic himself must fade;
All things to end are made;
The plague full swift goes by;
I am sick, I must die—
Lord, have mercy on us!"

Watrous (7) records that the Elizabethan poet and dramatist John Fletcher died of the plague in August, 1625, and to this effect quotes Aubrey's **Brief Lives:**

"Mr. John Fletcher, poet: in the great plague, 1625, a knight of Norfolk (or Suffolke) invited him into the countrey. He stayed about to make himself a suit of cloathes, and while it was making, fell sick of the plague and dyed."

Nearly everybody has some knowledge of the Great Plague which visited London in 1665. This outbreak, which is believed to be the twelfth that had afflicted the City, was more widely known because of the vivid accounts of its ravages which were written by talented writers of the seventeenth century. Such accounts may be found in Daniel Defoe's "Journal of the Plague Year", and in Ainsworth's "Old St. Pauls". Defoe and John Bunyan, although neither died from the plague, were interred in one of the chief burial grounds for London plague victims. This is Bunhill Fields, the name of which, according to Curtis (2), was originally and sinisterly, Bone Hill Fields.

Among contemporary poets, James Thomson (1700-1748) has, perhaps, given the most graphic description of the Great Plague in his poem **The Seasons—Summer.** His indication of the origins of the contagion doubtless reflected popular beliefs:

"What need I mention those inclement skies,
Where, frequent o'er the sickening city, Plague,
The fiercest child of Nemesis divine,
Descends? from Ethiopia's poison'd woods,
From stifled Cairo's filth, and fetid fields
With locust-armies putrefying heap'd,
This great destroyer sprung! Her awful rage
The brutes escape: Man is her destined prey;
Intemperate Man! and o'er his guilty domes,
She draws a close incumbent cloud of death;
Uninterrupted by the living winds,
Forbid to blow a wholesome breeze; and stain'd
With many a mixture by the sun, suffused,
Of angry aspect. Princely wisdom, then,
Dejects his watchful eye; and from the hand
Of feeble justice, ineffectual, drop
The sword and balance; mute the voice of joy
And hush'd the clamour of the busy world.

"Empty the streets, with uncouth verdure clad;
Into the worst of deserts sudden turn'd
The cheerful haunt of Men; unless escaped
From the doom'd house, where matchless horror reigns,
Shut up by barbarous fear, the smitten wretch,
With frenzy wild, breaks loose; and, loud to Heaven
Screaming, the dreadful policy arraigns,
Inhuman and unwise. The sullen door,
Yet uninfected, on its cautious hinge
Fearing to turn, abhors society:
Dependents, friends, relations, Love himself,
Savaged by woe, forget the tender tie,
The sweet engagement of the feeling heart.
But vain their selfish care: the circling sky,
The wide-enlivening air is full of fate;
And, struck by turns, in solitary pangs
They fall, unblest, untended, and unmourn'd.
Thus o'er the prostrate city black Despair
Extends her raven wing."

Byron's genius, too, has caught the exceeding horror of the plague in these few lines in **Manfred** (II. 3.718):

"The city lies sleeping;
The morn, to deplore it,
May dawn on it weeping:
Sullenly, slowly,
The black plague flew o'er it—
Thousands lie lowly;
Tens of thousands shall perish;
The living shall fly from
The sick they should cherish;
But nothing can vanquish
The touch that they die from."

The imaginative Shelley also wrote of it with telling effect; for instance, in these words from **Hellas:**

"At the third watch the Spirit of the Plague was heard abroad flapping among the tents; those who relieved watch found sentinels dead,"

and, in **Peter Bell the Third** (III. 21),

". . . in a town plague-stricken, each man, be he sound or no, must indifferently sicken."

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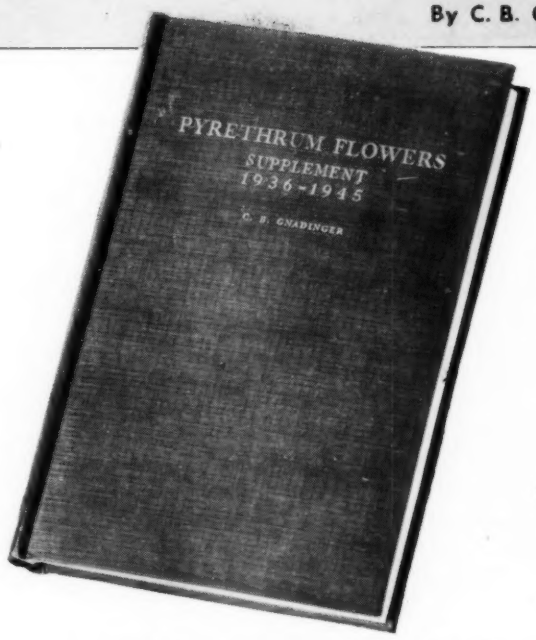

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England has been free of plague for many years and reference to it by modern English poets is rare. However, sporadic outbreaks still occur from time to time in various parts of the world. The chief endemic centres at the present time are in Asia, India and China, where it still causes high mortality, ten million deaths from plague having been recorded in India alone in a period of twenty years. In Europe, thanks largely to improved sanitary conditions and the application of modern knowledge, it has apparently largely disappeared. An important source of danger in commerce is ship-borne infected rats. To lessen this danger, authorities have passed legislation requiring ships to be fumgiated periodically to destroy the rats, and rat guards are required on all ships while in port. It is of interest to note that plague has been established in the United States since 1900, when it appeared for the first time in San Francisco, California. Since then, about 500 cases have been reported in the western and southern states (up to 1941), and the disease now occurs widely in that region in wild rodents, which serve as a reservoir from which domestic rats and man may become infected.

To return to the flea carriers of plague, the species which the poets and dramatists usually had in mind was most likely the human flea, **Pulex irritans** L., which prefers man to other mammals. It is certainly the species referred to by Thomas Hood in his poem **The Cannibal Flea,** of which the following is a sample:

"It was many and many a year ago,
In a district styled E. C.,
That a monster dwelt that I came to know
By the name of the Cannibal Flea
And the brute was possessed of no other thought
Than to live—and to live on me."

Also, it is doubtless the species met with in a Spanish inn by Hilaire Belloe, and commemorated in his poem **Tarantella:**

"Do you remember an Inn, Miranda?
"Do you remember an Inn?
And the tedding and the spreading
Of the straw for a bedding,
And the fleas that tease in the High Pyrenees,
And the wine that tasted of the tar?"

The cat and dog fleas, **Ctenocephalides felis** Curtis and **C. canis** Bouche, also attack man readily when hungry and separated from their normal hosts. These and the human flea are all capable of transmitting plague, and are also the intermediate hosts of the dog tapeworm, which is sometimes found in children who have been unfortunate enough to swallow an infected flea.

Dogs have always been notorious for the fleas they carry, and sometimes through neglect they become heavily infested. In **Jacula Prudentum,** Herbert, a contemporary of Shakespeare, remarks that "He that lies with the dogs, riseth with fleas", which is at least a statement of probability. Thomas Hobbes, in **Odyssey,** spoke of "the old dog Argos, full of fleas". Two-hundred years later, Andrew Lang, referred to the same dog in stanza 3, of **The Friend of Man,** as follows:

"We met him first in Homer's verse,
The dog by the Aegean seas;
He barks at strangers, ay, and worse,
He bites! We learn in language terse,
That even Argos has the curse of fleas!"

The question of controlling fleas has been a live one for ages, but it is probably only in recent years that the subject has been properly understood. Thomas Tusser, who wrote advice to farmers and their wives in the latter part of the sixteenth century, had the following to offer as a remedy against these blood-thirsty little pests:

"While wormwood hath seed, get a handfull or twaine,
To save against March, to make flea to refraine,
Where chamber is sweeped and wormwood is strown,
No flea for his life dare abide to be known."

The most satisfactory part of this advice is the sweeping, for scrupulous cleanliness is one of the best safeguards against flea infestations. Failing this, modern insecticides are very effective.

•Contribution No. 2381, Division of Entomology, Science Service, Department of Agriculture, Ottawa, Canada.

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USDA Scientists Awarded John Scott Medal

IN RECOGNITION of their work in developing insecticidal aerosols, the City of Philadelphia has awarded the John Scott Medal to Lyle D. Goodhue, Department of Agriculture chemist and Capt. Wm. N. Sullivan, entomologist on leave, in the U. S. Army. The joint award, consists of copper medals and a premium of $1,000. This is the first time the award has been made for an invention relating to insect control. It indicates both the value of the discovery and the wide interest in insect control.

☆ ☆ ☆

Warrant Issued For DDT Experts

A warrant has been issued for the arrest of persons representing themselves to be DDT experts who are soliciting residents to treat their homes for roaches, silver fish, and other household pests, according to a statement by Paul H. Millar, Chief Inspector, Arkansas State Plant Board, Little Rock, Ark. The men are operating without a state license and are charged with violation of Act 394 of 1939 which requires all pest control operators to be licensed by the Arkansas State Plant Board.

Reports have also been received by the Plant Board from other towns in the state indicating that other unlicensed operators may be active. Whether or not such operators are fakes who are attempting to cash in on the tremendous publicity which DDT has been receiving or whether they are capable of doing effective work with DDT and are just ignorant of the fact that a state license is required has not yet been determined.

The Plant Board issues licenses only to operators who have proved their qualifications and ability to do the work. The license issued by the Board is in addition to the occupation license required by Little Rock and other municipalities.

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DDT — TOXICOLOGY

By **A. L. DAVISON**, *Food and Drug Laboratories, Dept. of National Health and Welfare, Ottawa, Ont.*

Paper presented at a meeting of the Insecticide Advisory Committee, under the Pesticides Administration, Wartime Prices and Trade Board, Canada.

IN APPROACHING the toxicology of a new product, it is often profitable to examine the building blocks which go to make up the compound. A study of the chemical formula of DDT reveals the presence of two chlorobenzene groupings and a chloroform residue. Chlorobenzene is a well-known respiratory poison and the combination of two groupings attached to a methane nucleus constitutes a good contact poison; moreover, it exhibits symptoms reminiscent of phenol poisoning. The chloroform residue, $HC\text{-}CL^3$, besides being narcotic, acts as a solvent in the nerve lipoids of the body. These facts have been borne out in investigations on DDT toxicity and were in the minds of those who developed the product.

Although designed primarily for the destruction of disease-carrying and other noisome insects, precautions have to be taken for the safety of those who have to manufacture and use it. Extensive experiments on laboratory animals have revealed that the toxicity is more or less inversely proportional to the maturity and weight of the animals under test. Thus Neal et al. (1) found a fatality of over 50 per cent in the case of immature mice exposed to DDT spray, as compared with 15 per cent among full grown mice, 15 per cent among young rats and none in the case of adult rats or adult guinea-pigs. Dogs and monkeys, subjected to proportionately greater exposure, failed to develop toxic symptoms.

Nevertheless DDT is readily absorbed through the skin and may prove fatal. Application of a 3 per cent spray residue to the skin of mice developed toxic symptoms and gave evidence of a cumulative action. Dogs stood a similar test much better, but it should be noted that the concentrations used were in the order of 3,000 times greater than that required for insect destruction.

Neal and his associates report that a thorough clinical and laboratory examination of 4 persons before and after a heavy exposure to DDT over a period of 14 weeks, revealed no definite sign of injury. On another occasion (2), Neal has expressed the opinion that DDT in concentrations up to 10 per cent in an inert powder or in a 15 per cent spray for flies was not toxic to man. One point to remember is that DDT is insoluble in water and therefore in the fluid of the stomach. When, however, it comes into contact with the human body in a state of solution, then absorption will take place.

Wigglesworth (3) reports the only case so far of DDT poisoning in man. This laboratory worker, anxious to discover whether DDT would cause dermatitis, deliberately kneaded a mixture of an acetone solution containing 25 Gm. of DDT and an inert earth with his hands for some minutes, covering them completely up to his wrists. On removing his hands, the acetone evaporated, leaving a dry deposit on the skin which he swabbed off with acetone.

No redness developed, but within a few days he began to experience a feeling of heaviness and aching in the limbs and weakness in the legs, accompanied by extreme nervous tension. In spite of a holiday, the condition became worse and he was obliged to remain in bed, during which confinement acute mental anxiety developed and tremors occurred all over the body. He was away from work for 10 weeks and even after a year had not fully recovered.

A feature of the case was the mysterious nature of the ailment, for neither the patient nor his advisers realized until well on that it was a case of DDT poisoning.

Seeing that this is the only recorded case and that no fatalities in man have occurred so far, it is impossible to indicate with certainty the human toxic dose. If swallowed dry or in an acacia emulsion base, the amount would be much larger than if taken in an oily solution; that is in view of the higher absorption of the solution. Moreover, one must needs turn to animals for information on the symptomatology of DDT. These are: (1) falling off of appetite; (2) irritation and excitability; (3) muscular tremors and clonic convulsions preceding death by respiratory paralysis. Post-mortem work on rabbits killed by DDT disclosed that the greatest concentration of DDT was found in the bile. Cases of headache have been noted among DDT workers in closed rooms.

Although in the human case recorded, the amount absorbed was greatly in excess of anything likely to occur in ordinary circumstances, one must take cognizance of the habitual carelessness of operators handling the material after familiarity has bred contempt. It is therefore not impossible that cases of cumulative intoxication may occur.

Consequently a search is on foot for an effective antidote. Vaz et al. in Brazil (4), in the light of work by Minot (5) on the effect of injections of calcium chloride in cases of carbon tetrachloride poisoning in dogs (carbon tetrachloride being allied to the chloroform residue in DDT) advocated intravenous injection of calcium gluconate to restore the calcium level in the blood. The results are encouraging. Urethane, a mild hypnotic and diphenyl-hydantoin, an anti-convulsant, have been suggested. These are all in a more or less tentative state and the investigation is still being pursued energetically.

Why has the Government of Canada recommended an emetic as an antidote for DDT? The answer is that a case of cumulative toxicosis is a matter for a physician rather than for a layman, but if someone swollowed a dangerous amount of DDT the first thing to do is to remove it from the system and emetics are usually ready at hand. In any event, a doctor should be called.

Summing up this discussion, there is little evidence that DDT is notably toxic to man. If ordinary care is used consistently, such as the wearing of masks when mixing powders or using a spray in a confined space, the danger is not great, so far as present knowledge goes, but in the circumstances, such an opinion must be accepted with reserve.

It is in view of this incompletely crystallised state of present knowledge, that the Government of Canada in its wisdom has prescribed a poison label and the naming

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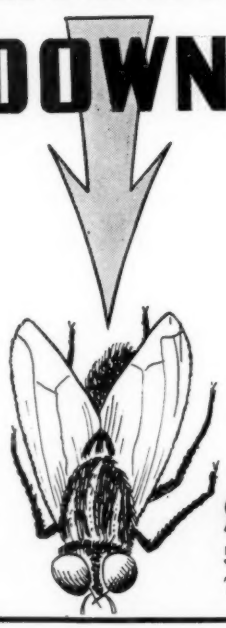

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of an antidote for DDT. In the last analysis, the Government is the custodian of the welfare of the people of Canada and, as such, dare not take chances. If or when the safety of DDT is finally established, the present ruling may be relaxed.

I wish to express indebtedness to Miss Susan O'Leary for valuable help in bringing portions of the literature to my notice.

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German Insecticides, Insect Repellents, and Rodenticides

DDT was widely manufactured in Germany and a number of variations were developed, such as difluorodiphenyltrichloroethane, known as Gix, and phenylchlorophenyltrichloroethane. The former was more easily emulsified and was claimed to be more effective than DDT though much more expensive. No other variations of the DDT molecule appeared advantageous.

An entirely new approach was taken in the development of "Lauseto neu" which is w-chloromethyl-4-chlorophenyl sulfone, said to be more active than DDT on the body louse and on bedbugs, but less so on flies. A mixture of the analogous w-chloromethyl phenyl sulfone and 3,4-dichlorobenzyl alcohol was even more active against bedbugs. Another new compound for uses similar to DDT is Lucex, which is not as effective as DDT but is cheaper and is made by chlorinating the side chain of ethyl chlorobenzene.

For plant lice the hexaethyl ester of tetraphosphoric acid, Bladan, was more effective than nicotine though suffering from instability in aqueous solution. Nirosans, the active principle of which is tetranitrocarbazole, was used for control of insects and fungi on vines with and without addition of copper compounds. For similar purposes sprays based on 1 sulfocyano-2,4-dinitrobenzene were used. Pentachloronitrobenzene and 1, 2, 4-trichloro-3,5-dinitrobenzene were employed as soil disinfectants and the former was also used to disinfect wheat seed. Many variations of the ordinary copper and arsenic insecticides were in common production.

While diethyl phthalate was largely used as a mosquito repellent, a very new compound, trichloroacetyl chloroethylamide was being tested. It appears to be effective against mosquitoes other than the anopheline (which is the malaria carrier) and superior to the phthalates.

The problem of replacing thallium in rodenticides became acute. Castrix was made from acetoacetic ester and urea followed by chlorination and amination. It is very toxic to mice but low in toxicity for domestic animals. A very new compound, p-dimethylaminophenyl diazo sodium sulfonate, was under development as another substitute for thallium in rodenticides.

Continued development of the Eulan moth repellants resulted in Eulan NK, triphenyl-3,4-dichlorophenyl phosphonium chloride, particularly resistant in textiles to washing, and Eulan AL, 3,4-dichlorophenyl-N-methyl sulfonamide which was produced in large quantities during the war.

—Chem. & Eng. News.

Some Effective Poison Formulas In Rodent (Rats and Mice) Control[1]

By **ROBERT M. BORG**, *Biologist,*
U. S. Fish and Wildlife Service,
Massachusetts State College, Amherst, Massachusetts.

ALTHOUGH sanitation and ratproofing are the ultimate solution to the rat problem the most common method employed to destroy large numbers of rats is by the use of poisoned baits. Sucecss in poisoning rats depends upon (1) kind of bait (food material) used, (2) kind of poison used with food material, (Example, red squill on sliced baits is not too good), (3) method of mixing the poison and bait, and (4) thorough coverage of infested area with poison bait. It is important that all other sources of rat food be removed or covered as far as practicable. Since rats are omnivourous and live and breed under various environmental conditions, it is a good policy to find out what kind of food they prefer before attempting to poison them. This is called prebaiting. It consists of preparing and distributing one or more unpoisoned (clean baits throughout the premises where rats will find them. Prebaiting enables one to determine what kind of food the rats will eat, where they will eat it, and the approximate amount of bait needed for the poisoning of the population.

When the kind and quantity of bait is known a poison is added. The type of poison used is important and varies with each rat infestation. One would not risk using thallium sulfate in a food manufacturing plant or using red squill twice in succession in a bakery within two weeks or even longer!

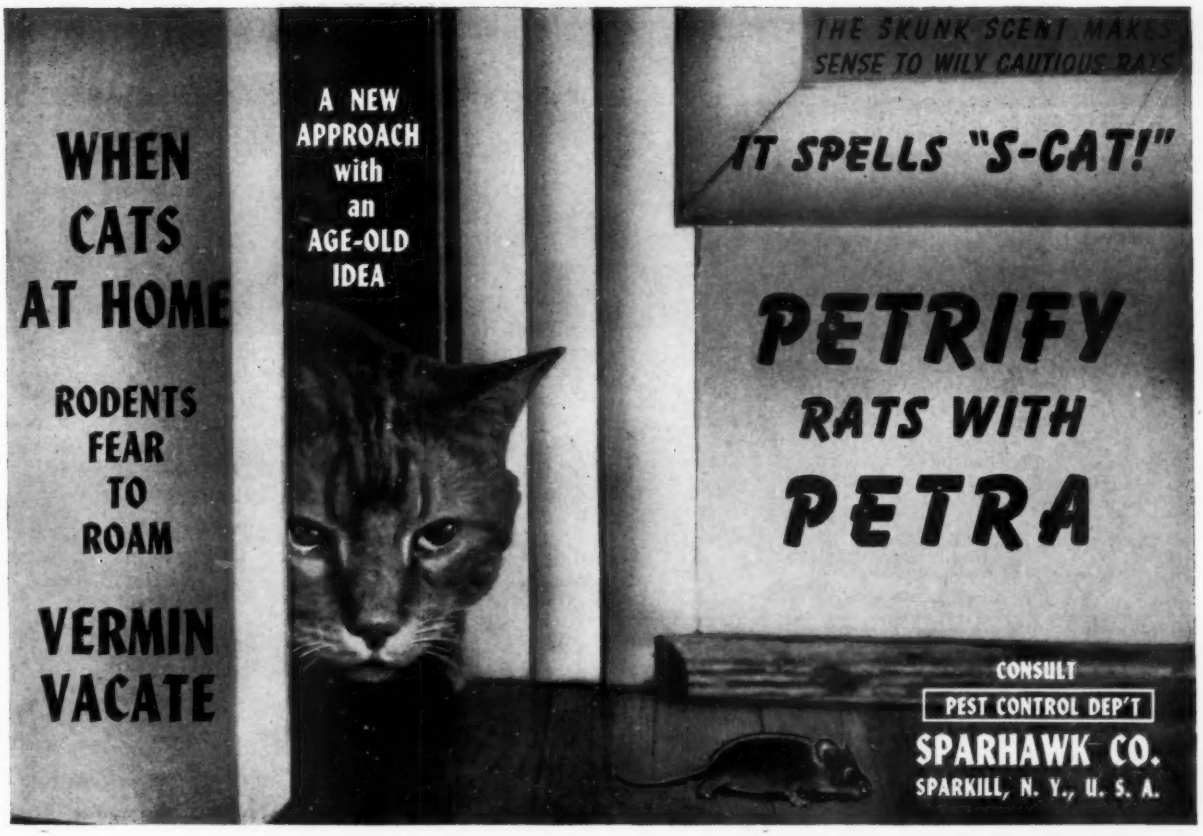
To obtain effective control thorough preparation or mixing of the poison with the bait is necessary. To obtain a uniform mixed **wet** bait, water, oil, or some other liquid should be added to the poison to make a paste. Then the paste should be mixed thoroughly with the bait. In preparing **dry** mixed bait, a spreader or diluent such as flour can be added up to 5 times the **volume,** not weight, of poison (arsenic trioxide, thallium sulfate, zinc phosphide). No spreader is needed for red squill and barium carbonate. In using strychnine twice the amount of powdered borax should be used for best results. The borax acts as a spreader and sweetens the bait.

A teaspoonful of the prepared poison bait is a sufficient quantity for the average rat. Put the baits in places frequented by rats, preferably where they are known to feed, but out of reach of domestic animals. A sufficient number of baits should be distributed at one time in order to provide an ample supply for every rat feeding in the area. Baits should be distributed late in the day so they will be fresh when the rats feed at night. All uneaten baits should be picked up two days later and destroyed. Finally, it is well to wait 2 weeks or longer before repeating with other baits and poisons.

EFFICIENT POISON FORMULAS[1,2]

No. 1—
- (a) 1 ounce zinc phosphide
- (b) 3 ounces mineral or cottonseed oil
- (c) 12 ounces peanut butter
- (d) 4 pounds ground white bread crumbs or rolled oats

No. 2—
- (a) 2½ ounces "micronized" arsenic trioxide
- (b) 2 ounces glycerin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(c) 2 pounds ground horsemeat, or beef
(d) 3 pounds ground white bread crumbs, cornmeal, or rolled oats

No. 3—

(a) 9 ounces toxic red squill (500-600 mg/kg)
(b) 8 ounces corn or cottonseed oil
(c) 8 ounces blackstrap molasses
(d) 4 pounds chicken laying or egg mash

No. 4—

(a) 1 pound barium carbonate
(b) 2 pounds cornmeal
(c) 1 pound or 1 pint water
(d) 2 pounds freshly ground fish

No. 5—

(a) 1 ounce zinc phosphide
(b) ½ ounce Magnesium carbonate (spreader)
(c) 2 ounces mineral oil
(d) 5 pounds cut carrots (1-inch cubes)

No. 6—

(a) 1 ounce Thallium sulfate
(b) ¼ cup flour (diluent)
(c) 5 pounds chopped lettuce

No. 7—

(a) 2½ ounces "micronized" arsenic trioxide
(b) ¼ cup flour (diluent)
(c) 5 pounds thinly sliced bananas with rind

No. 8—

(a) 2½ ounces "micronized" arsenic trioxide
(b) ¼ cup flour (diluent)
(c) 5 pounds sliced tomatoes or sweet potatoes

No. 9—

(a) 1 ounce Thallium sulfate
(b) ½ gallon warm water
(c) 4 ounces sugar or cane syrup

No. 10—

(a) 2 ounces "micronized" arsenic trioxide
(b) 4 pounds or 2 quarts water (boil with poison for 20 minutes)
(c) 2 quarts tomato juice or soup, or evaporated milk

[1]In all formulas add (a) to (b) and stir thoroughly into (c), then mix well with (d) where listed.

[2]Other poisons in correct weight or proportion may be added to numbers 1 to 8.

Numbers 6, 7, 8, 9, and 10 are most attractive to black rats. Numbers 1, 2, 5, 7, and 9 are readily taken by house mice.

Number 1, 2, 3, and 9 are permanent type baits (baits that do not radically change their characteristics during several hours or days of exposure (remain attractive to rodents) and can be stored for a long period of time without spoilage). Numbers 4, 5, 6, 7, 8, and 10 are fresh baits (baits freshly prepared that deteriorate or break down after overnight exposure and are no longer attractive to rodents).

There are no basic food materials or attractants in rat control or any "sure-fire" formula that will lure all rats. The best procedure is to expose a number of simple foods to ascertain just what foods rats and mice will eat. Most poisons will kill rodents, but some are more effective than others. Experience has shown that further work is needed in testing new poison formulas. The real value of binders, moisteners, lures, preservatives, and bait color in the preparation and acceptance of poison bait formulas has not been adequately worked out. Nor is there sufficient evidence available to substantiate the claims for some preparations.

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1 Delivered before Fifth Annual Eastern Pest Control Operators' Conference, Massachusetts State College, Amherst, Massachusetts, February 5, 1945.

Diseases Transmitted From Rats To Man

(*Abstract*)

By V. T. SCHUHARDT, Ph.D., *Professor of Bacteriology, The University of Texas*

THE RATS included in this discussion are the so-called "alien" rats, **Rattus norvegicus** and the three varieties of **Rattus rattus: R. rattus rattus, R. rattus alexandricuus,** and **R. rattus frugivorous.** These rats have evolved a closer cohabitation with man than most of the other rats and as a consequence might be expected to serve a greater role in maintaining and transmitting human diseases. This situation is not true, however, in the case of the rats and field mice serving as reservoir hosts in the case of scrub typhus (tsutsugamushi).

These rats are capable of harboring at least eleven disease organisms which can infect man. These disease organisms are transmitted to man either directly by the bite of the rat or handling of rat carcasses or indirectly by food contamination or blood sucking arthropods. Table I shows a summary of the modes of transmission of rat-bourne diseases to man.

TABLE I

MODES OF TRANSMISSION OF RAT-BOURNE DISEASES TO MAN

I. Direct Transmission

A. Saliva of the rat the primary vehicle.

1. Biting the means of contact.
Rat bite fever
(Spirillum minus)
(Streptobacillus moniliformis)
Syn. **(Actinomyces muris)**
Rabies possibly.
(Virus)

B. Tissues of rat the primary vehicle.

1. Handling, skinning, dissecting, etc. means of contact.
Plague, typhus, relapsing fever, etc.

II. Indirect Transmission

A. Intestinal and/or urinary excreta of rat the primary vehicle.

1. Food the secondary vehicle—mouth the portal of entry.
Salmonella gastroenteritis (Food infection)
(Salmonella typhi murium)
(Salmonella enteritidis)
Infectious jaundice (Weil's disease)
(Leptospira icterohaemorrhagiae)

2. Muddy water in mines, irrigation ditches, etc. the secondary vehicle—skin the portal of entry.
Infectious jaundice (Weil's disease)

B. Blood of rat is the primary vehicle.

1. Fleas **(Xenopsylla spp.)** the vector.
Bubonic plague
(Pasteurella pestis)
Murine typhus fever
(Rickettsia prowazeki)

2. Mites **(Trombicula spp.)** the vectors
Scrub typhus (Tsutsugamushi)
(Rickettsia orientalis)

3. Ticks **(Ornithodoros spp.)** the vectors
Relapsing fever (possibly)
(Borrelia recurrentis)

C. Tissues of rat primary vehicle to the hog (relatively rare).

1. Hog flesh the primary vehicle to man.
Trichiniasis
(Trichinella spiralis)

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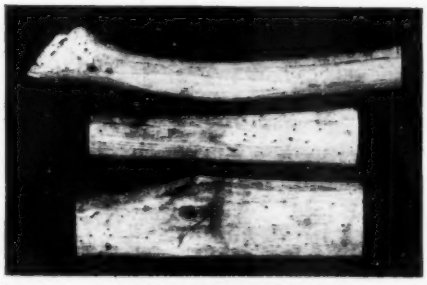

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The Use Of DDT In The Control Of Stored Product Pests

By **H. E. GRAY**, *Officer in Charge**

THE CONTROL OF INSECTS infesting stored products is almost entirely dependent upon the use of chemicals in the form of contact sprays and fumigants. It is also possible to utilize extremes of temperature as many of these pests may be killed by either high or low temperatures. Parasites, predators, and diseases play a very minor role in the control of these pests whereas they are of great importance in the case of field and forest insects.

Where food products are concerned, the ideal material is one which is highly toxic to insects and entirely harmless to man and the higher animals. Unfortunately this ideal is almost impossible to attain. The entomologist is therefore obliged to pick materials which are relatively harmless to his fellows and at the same time do possess reasonable toxicity for insect pests. If materials which are highly poisonous to humans and the higher animals are used, it is necessary to make the applications at certain stages in the plant's growth where the portion used as food will carry a minimum amount of the poison or to take steps to remove a large part of the poisonous residue before the material is consumed. Obviously this method cannot be applied to products in storage because of their very nature which precludes the possibility of further treatment.

One of the striking characteristics about DDT is the residual toxicity which is displayed toward a large number of insect pests. One of the most satisfactory methods of producing this effect is by the application of the poison in an oil carrier. DDT in oil is highly toxic against flies and its use in wash rooms and other places where flies are prone to be present in food processing plants is one way in which this material may be used with highly satisfactory results and apparently with safety. In view of our present lack of definite knowledge as to the toxicity of DDT to man and the higher animals, the use of this material around food products appears to be a dangerous procedure. Furthermore, in many cases the conditions under which the production is carried on are entirely unsuitable for DDT to exert its residual toxicity.

The use of DDT does not appear to be very promising in connection with the control of insects in flour mills or terminal grain elevators. In the former case the insect population is, for the most part, concentrated in certain of the machines used in the processing and separation of the various streams of material and it does not seem wise to apply DDT to the inner surfaces of such machinery. Actually, if it were applied in such locations, the residual effect would soon be lost because the flow of the food material against the treated surface would soon remove the crystals of DDT from the walls of the machinery. Storage bins would be affected in a like manner. In each case, the DDT would be incorporated in the food product.

In the case of grain elevators, regardless of how clean the walls may be prior to loading, the filling operation will lay down an appreciable layer of dust on the upper walls and ceiling and prevent intimate contact of the insects with the DDT residue. Even if these walls were swept down prior to spraying, the filling of nearby bins would replenish the coating of dust on the upper portion of the bin. When grain moves rapidly the bin is likely to be emptied and refilled after a short interval and this would lay down a further deposit of dust. When applications of DDT are made in these situations there is little possibility of killing the insects through the residual toxicity.

In the laboratory, DDT mixed with grain is effective in killing grain insects at quite low concentrations. However, in Canada the amount of grain infested with these pests is not sufficiently large to warrant the treating of all grain at the time when it is put in storage. It is much more economical to control these pests after infestations develop by means of fumigation and other control measures.

Tests conducted with five per cent aerosols of DDT and similar aerosols of extract of pyrethrum showed at the expiration of forty-two hours a slight mortality in the grain bins sprayed with DDT while the ones treated with pyrethrum revealed a kill of approximately eighty-five per cent of the larvae of the Indial meal moth. Equally good results were secured with a contact spray of ten per cent pyrethrum applied by means of an electric sprayer.

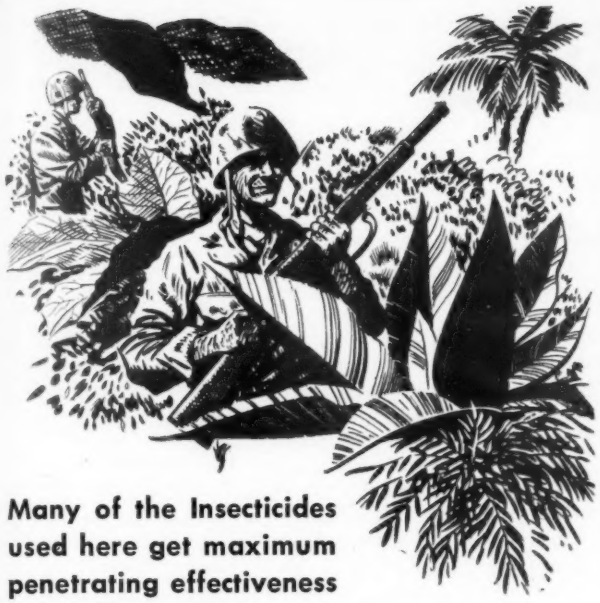
The use of DDT in the control of flies in milk plants has been suggested. If this material is used under such circumstances it is imperative that the building should be thoroughly screened in order that the fly population may be kept at a minimum. If window screens and screen doors are not used, in spite of the toxicity of this material to the flies, there will be large populations within the building and the time required for DDT to kill the flies will allow plenty of time for some of them to get into open milk vats. Keeping the flies out of the building is much better practice than allowing them free access and depending upon deposits of DDT to kill them after they gain entry.

If applications of DDT are used in food plants to control insect pests, it is absolutely essential that steps be taken to protect the product from contact with the spray at the time when it is being applied. The writer feels that materials such as extract of pyrethrum which possess lower toxicity to higher animals are much to be preferred to DDT because of their comparative safety.

Experimental work with certain of the metallic oxides indicates that these materials are quite toxic to many of the stored product pests found in food warehouses. Because of their almost negligible toxicity to man, their use appears to be indicated in plants where food is being processed. These materials promote water loss from the bodies of insects and experimentally, control results equal to DDT have been secured.

Contribution No. 2382, Division of Entomology, Science Service, Department of Agriculture, Ottawa, Canada.

*Stored Product Insect Investigations, Division of Entomology, Department of Agriculture, Ottawa, Canada.



Many of the Insecticides used here get maximum penetrating effectiveness when the base is

penn-drake

Insecti-sol

Whether for civilian or military use, maximum penetrating effectiveness of an insecticide is of topmost importance. Because Penn-Drake deodorized Insecti-sol floats longer, it enables your preparations to penetrate deeper and achieve greatest kill. Being 100% volatile, Insecti-sol evaporates completely, leaving no residue to stain or soil drapes, rugs, clothing, or other fabrics. For modern insecticides, PENN-DRAKE INSECTI-SOL is the ideal base.

Mothicides ***Write for information on Penn-Drake odor-free Naphtha, a superfine base for mothicides. Full details will be furnished gladly.***

penn drake petroleum products

PENNSYLVANIA REFINING CO.

General Office: BUTLER, PA.

Makers of White Oils (U.S.P. and Technical); Petrolatums (all grades and colors); INSECTI-SOL (deodorized insecticide base); Odor-free and other Naphthas; Petroleum Sulphonates; Waxes; Industrial and Motor Lubricants and Greases; Fuel Oils, and other petroleum products.

FOR A THOROUGH TERMITE CONTROL JOB

treat the wood — and the soil with . . .

TERRA TOX

Nos. 225, 235 and 245 for WOOD and SOIL

Oil soluble

No. 215 Especially for SOIL

Water soluble

CONCENTRATED—YOU DON'T PAY FOR WATER OR THINNER — AND ADD IT!

Terratox is highly concentrated solution—you don't buy and pay for shipping of water or thinners. You just add your own when you're ready to do the job.

Diluted to directions, Terratox No. 225 contains the required 5% (by weight) pentachlorophenol base to meet the standard recommended by the U. S. Department of Agriculture. Terratox No. 225 is unexcelled for wood treatment for control of termites, powder post (lyctus) beetles and borers. Effective for many years.

Terratox No. 215, thinned with water, supplies the recommended base of sodium salt of pentachlorophenate for complete effectiveness against termites soil control. High saturation powers.

Available in 1 and 5 gallon cans and 30 and 55 gallon drums.

Here's a valuable bulletin that every pest control operator should have and keep handy for reference.

Sent free upon request—write for it!

TERRA-TOX BULLETIN on TERMITE CONTROL

WOOD TREATING Chemicals Co.

5137 Southwest Ave.
St. Louis 10, Mo.

LOCAL ORGANIZATION NEWS

New England Pest Control Association

A new Constitution and By-Laws was passed by the New England Pest Control Association at the October 10th meeting in the Hotel Lenox, Boston. Much credit is due the committee headed by Charles W. Houghton for their hard work in revising the old regulations. The new By-Laws passed unanimously with a minimum of change.

J. H. Hoeffler of the American Cyanamid Co. spoke briefly on some of the technical aspects of DDT and answered questions from the floor.

The meeting was in charge of President Lester West. Others attending were: J. Newman, Holyoke; C. A. Chafe, Quincy; R. M. Houghton, Boston; E. P. Myers, Brookline; George Ford, Worcester; Norma Goldman, Providence; Tom Burd, Waltham; G. R. Elliott, Worcester; J. Harrie Burdge, Maymond, Me.; Mark Weintraub, Boston; A. F. Higgenbotham and L. R. Walsh, Brockton; F. E. Bohman, O. N. Anderson and T. J. Ledwith, Hartford; A. Bain and A. Kaplan, Lowell; E. Maguire and O. N. Sangerfield, Haverhill; Hart Harris, Jr., T. A. Sheehan, Morris Schwartz and Lester M. West, Boston and Kenneth N. Cook, Worcester.

Submitted by Kenneth N. Cook, Secy.

Professional Exterminators Association, Inc.

The Professional Exterminators Association's meeting was held Monday, October 15, 1945 at the Hotel Commodore.

The following Officers and Directors were elected:

President: Milford H. Oachs, Ozane Co., 555 W. 22nd St., New York 11, N. Y.

Vice President: Joseph Finneman, Pest Control Corp., 2028 Broadway, New York 23, N. Y.

Secretary: (re-elected) Jack Shaff, A & P Exterminating Co., 1662 Coney Island Ave., Brooklyn 30, N. Y.

Treasurer: (re-elected) William Farrell, Effective Exterminating Co., 223 Bushwick Ave., Brooklyn 6, N. Y.

Directors:

Jacob L. Huberman, Scientific Ext. Co., 1 E. Fordham Road, Bronx, N. Y.

Jack Benmosche, Evins Ext. Co., 44 West 44th St., New York, N. Y.

Charles Pomerantz, Bell Ext. Co., 20 Hudson St., New York, N. Y.

William Thorpe, Tops Ext. Service, 6006 7th Ave., Brooklyn, N. Y.

Raymond Davenport, Davenport Pest Control, 1516 Jefferson Ave., Brooklyn, N. Y.

A resolution was passed that the retiring President, Mr. Joseph Finneman, be presented with a plaque or scroll as a memento and mark of appreciation for his five (5) years of untiring service. It was further resolved that this custom be followed in the future.

It was further resolved that at the Annual Dinner, William O. Buettner, Secretary of the National Pest Control Association, be the guest of honor and a plaque or some other suitable memento be presented as a mark of the Association's appreciation for the work he did for the industry during the war period.

Members exchanged formulations and experiences with DDT and the matter of life insurance and hospitalization for the men was also discussed.

Northern California Pest Control Association

was organized on October 6, 1945 at the Palace Hotel in San Francisco. A constitution and By-Laws were adopted at the morning session. During the afternoon Dr. Guy F. MacLeod, now with Sunland Industries of Fresno, Calif., and an honorary member of the NPCA, discussed DDT and its problems. Attending the meeting was Art Beliveau, President of Pest Control Operators of California, Inc., who stayed for the dinner party which followed.

Officers elected were: V. H. Montgomery, President, San Francisco; C. D. Cain, Vice-President, Fresno; E. O. Corson, Director, Berkeley; J. E. Baechler, Director, San Jose; A. T. Parsons, Director, Burlingame; V. B. Fortna, Director, Santa Rosa; W. P. Newton, Director, Stockton; E. L. Barrett, Treasurer, Berkeley; H. H. Montgomery, Secretary, San Francisco.

Additional charter members are: Elmer A. Roberts, C. C. Delk, C. W. Hilliker, Robert E. Hackley, Wayne K. Davis, George G. Aikenhead, M. Barrott, Clyde E. Bruegger, O. L. Burritt, N. A. Kelly, G. D. Cardiff, J. E. Wesley, J. W. Killinger, E. G. Mills.

Meetings will be held quarterly. Secretary's office is located at 1161 Post Street, San Francisco, Calif.

Eastern Pennsylvania Pest Control Association Meets in Reading, Penn.

On September the 18th, 1945, a regular meeting of the Eastern Pennsylvania Pest Control Association was held at the Elks' Club in Reading, Pennsylvania. Mr. Pete Salino of the J. C. Ehrlich Company, who acted as Host and Master of Ceremonies, had done a swell job in furnishing one of the worst rain storms of the season and, at the same time, one of the best meals and a most comfortable and delightful meeting-place. The spirits, which were somewhat dampened, of those who had traveled long distances and in a down-pour of rain, were quickly elevated by a round of delicious cocktails generously contributed by the J. C. Ehrlich Company.

After an appropriate prayer, offered by the Secretary, Mr. Russell Bauer, the National Anthem was sung and a welcoming address was delivered by Pete Salino.

After a luscious apple pie with coffee, Mr. J. C. Ehrlich introduced Mr. Lawrence S. Dillon, Curator of Insects of the Reading Public Museum, who gave an entertaining talk on the subject of "Our Friends, the Insects," elaborating on some very interesting facts regarding the importance of insects and explaining the dollars and cents value of insects.

After a short recess, Mr. John G. Vogel introduced the second speaker, Mr. Hugh Smith, Manager of the Better Business Bureau of Philadelphia, who gave a vivid description of the wicked practices and rackets with which unscrupulous con-men prey on the general public in order to cheat unsuspecting business men out of their hard-earned money. Mr. Smith proved to be a skilled and fascinating speaker whose talk proved very interesting, entertaining and instructive.

After a short recess, the business meeting was called to order by the Vice-President, Mr. D. L. McCullough, whom President Bud Sharp had asked to act as Chairman in deference to the up-state members of the Association. Mr. McCullough discharged his duties in a most acceptable manner.

The Minutes of the previous meeting were read and approved and, in the absence of the Treasurer, Mr. York King, who was unable to attend, the Secretary gave a brief report on the condition of the Treasury. This was followed by reports from the Chairmen of the various committees, and by the acceptance to membership of Mr. J. L. McClure of Camden, New Jersey, who was then welcomed into the Association by Vice-President McCullough.

Upon motion, it was decided to hold the next meeting on December 11th in Philadelphia, and the nominating committee was instructed to have recommendations for nominations of officers ready at that meeting.

The meeting would not have been complete without a brief and appropriate discussion of DDT, which was offered by Mr. Hoeffler of the American Cyanamid & Chemical Company, who also displayed a sample of the new, First-Aid Kit which his company is offering to fumigators at a cost of $16.50.

After offering a rising vote of thanks to Mr. John G. Vogel and Mr. J. C. Ehrlich for securing the speakers, the meeting was adjourned.

There were 32 in attendance representing the following companies:

Vogel-Ritt, Inc.
Theodore Meyer Estate
Smithereen Exterminating Co.
McWilliams Pest Control System.
Boohar Chemicel Co.
Shur-Way Exterminators, Scranton
Victory Exterminating Co.
Sanitary Exterminating Co., Williamsport
A. H. Richards & Sons, Wilkes-Barre
U. S. Fumigating Co.
Western Exterminating Co.
J. C. Ehrlich Co., Reading
Carl L. McClure, Camden, N. J.
Bauer Exterminating Co.
American Cyanamid & Chemical Co.
Mr. Hugh Smith
Mr. Lawrence S. Dillon.

—John G. Vogel,
Chm. of Public Relations Com.

N.A.I.D.M. TO MEET

The National Association of Insecticides and Disinfectant Manufacturers will hold its annual meeting in the Hotel Commodore, New York, December 3 and 4.

Write For These Booklets

(Continued on page 38)

FUMIGATION AND PLASTICS

News release discusses use co-ordination of such diverse chemical products as plastics and fumigants in connection with infested bagged grain, seed, packaged or boxed foodstuffs. Methyl bromide-plastic-tarpaulin method of disinfestation described.

WRITE PESTS—DOW.

SIX TOXICANTS

Release describes six different types of toxicants, combinations of a type of Thanite and DDT or DDT.

WRITE PESTS—HERCULES.

DDT Labeling Instructions Issued by Insecticide Division, U. S. Department of Agriculture, W. G. Reed, Chief.

Reprint of foregoing may be had by writing John Powell Co., 1 Park Avenue, N. Y.

NAVY PURCHASES FILM

The film "Insect and Rodent Enemies of Man" has been purchased for use in training Navy Personnel.

(Above statement made with Navy Dept.'s permission.)

You too can use the film for teaching sales and service men, and show to clubs and business organizations.

It is a remarkably stirring inspirational, educational film; 106 scenes, 52 titles, 800 ft., 16 mm black & white silent, requiring 30 minutes to show. $110.

Send for booklet

HENRY TURRIE

522 West North Avenue, Milwaukee 12, Wisconsin

POST-WAR DISCLOSURE No. 1

It has been no secret that for more than two years we have been developing and experimenting with a new synthetic organic insecticide material on an increasingly broad scale and over a wide range of insects and fields of usefulness. Nor is it any secret that the product has demonstrated extraordinary value and versatility.

PYRENONE NO. 20

The first of the new developments based on this chemical is now available, and a fully descriptive bulletin on it will be ready for distribution early in October. Mailing lists, and particularly our own, being notoriously imperfect, we suggest that anyone feeling doubtful about receiving a copy in the regular way send us a card or letter so that we may correct our list.

Space limits our present description of PYRENONE NO. 20 to the statement that it combines our new chemical with pyrethrum in correct proportion to provide an odorless, light-colored, stainless concentrate, ideal for use in oil-base sprays for household, dairy, or agricultural use. PYRENONE NO. 20 is substantially cheaper than Pyrethrum No. 20, far more effective at the same dilutions, more stable, and with greater residual kill, and equally free from any objectionable characteristics including toxicity to warm-blooded animals.

Dodge & Olcott, Inc.

180 VARICK STREET, NEW YORK 14, N. Y.

BOSTON • CHICAGO • PHILADELPHIA • ST. LOUIS • LOS ANGELES

Plant and Laboratories . . . Bayonne, N. J.

EXTERMINATORS CHEMICALS

RUMETAN (Zinc Phosphide)

FOR RAT CONTROL

(The ideal poison for Rats, Mice and Mole Crickets Effective and Economical)

Sodium Fluoride, White and Tinted
Sodium Silico Fluoride
Pyrethrum Powder
Sodium Arsenate, etc.

Write for Details

Pfaltz & Bauer, Inc.

EMPIRE STATE BUILDING, NEW YORK

PHOSPHOROUS PASTE

FOR ROACHES and RATS

SINCE 1874

J-O Phosphorous Paste is so compounded as to eliminate the hazard of fire and possesses advantageous qualities peculiar to itself. A properly made **Phosphorous Paste** such as **J-O** is absolutely safe to use. It cannot burn or set fire to other substances.

Phosphorous, however, remains basic in the compound because it is the most toxic chemical used in pest exterminating, being more toxic than arsenic, strychnine or thalium. Approximately one-tenth of a grain will kill a rat. Phosphorous is a slow poison, taking from 6 to 18 hours to kill. Due to its slow but positive action, the rat succumbs to this poison. He becomes very uncomfortable and, seeking fresh air and water, in most cases, leaves the premises and dies in the open.

For all species of roaches, this product is **UNEXCELLED.**

JOHN OPITZ, INC.

50-14 39th Street Long Island City 4, N. Y.

Manufacturers of Exterminating Products Since 1874

WHAT'S NEW IN PEST CONTROL-PERSONALS

OBERWAGGER SUCCEEDS ZIMAND: Dr. Ernest L. Stebbins, Commissioner of Health, N. Y. C., announced recently that Dr. John Oberwagger, who joined the department in 1907, would succeed Savel Zimand as director of the Bureau of Health Education. Mr. Zimand resigned. Dr. Oberwagger has been director of the Sanitary Bureau, name of which has been changed to Bureau of Sanitary Engineers, with Mr. Fletcher as its new head.

LT. W. K. DELPLANE, JR., recently returned from the Pacific where he spent 20 months in New Guinea. He was Officer in Charge of U. S. Navy Malaria and Epidemic Control Unit. He is at present connected with the Navy Epidemiology Unit at the Northwestern University School of Medicine, Great Lakes, Ill.

PROSKEY TO DIRECT SALES—H. H. Proskey, general sales manager of Lehn & Fink Products Corporation, New York, for the past 12 years, has been appointed director of sales and advertising for Michigan Chemical Corporation, St. Louis, manufacturer of DDT. The company is planning to open a New York office with Mr. Proskey in charge.

MacLEOD JOINS SUNLAND INDUSTRIES—Dr. Guy F. MacLeod, former University of California entomologist, who resigned as chief of the Chemicals and Fertilizers branch of WFA on Sept. 1, became general manager of the sulfur and insecticide departments of Sunland Industries, Inc., at Fresno, Calif. He is to supervise, direct and promote all activities of his new departments, including research and experimental work in line with the company's post-war expansion plans.

BOB HACKLEY of Palo Alto, and **ERNIE MILLS** of San Francisco have been honorably discharged from the Coast Guard Temporary Reserve Afloat in the 12th Naval District, effective with the disbandment of their unit on September 30. They had served 12 hours a week in patrol duty off the West Coast.

DDT LABELING—To be sure, all labels should be submitted to Dr. W. G. Reed, Livestock and Meats Branch, U. S. Dept. Agriculture, Washington, D.C. Some states require a poison label, notably California, Oregon and Minnesota—likewise percentage of DDT contained. In California, if over 1% is used a poison label is required. Following states (up to now) require percentage of DDT on label—Florida, Michigan, California, Minnesota, Mississippi, Oregon, Pennsylvania, South Dakota, Tennessee and Wyoming. If used on livestock, North Dakota requires percentage on label. Patent No. 2,329,074 should appear on label.

GETS THE GALLINIPPER—An ingenious and simple poisoning devise that works automatically against certain types of vexatious mosquitoes does so by withholding a deadly dose of DDT until it is needed and then delivers it at the time it will be most effective against newly hatched wigglers. Research efforts have been rushed for protection of the armed forces against insect pests and insect-carried diseases.

DR. H. O. CALVERY—Dr. Herbert O. Calvery, chief of the Division of Pharmacology of the Food and Drug Administration, died in his home in Washington on September 23, at the age of 48.

Joining the government in 1935 to assist in the organization of the division, he became its chief in the fall of 1936. He received his education from Greenville College, and the University of Illinois. Later he taught at the University of Louisville, Johns Hopkins, and the University of Michigan. During the war Dr. Calvery did much of the investigating work on the safety of many new products for the armed services and substitutes for civilians. Much of his work had to do with antimalarials, DDT, war gases, and chemical venereal prophylactics.

STARR JOINS PENICK—Dr. Donald F. Starr has joined the research department of S. B. Penick & Company. He was formerly on the staff of the Insecticide Division of the Bureau of Entomology and Plant Quarantine at Beltsville, Maryland.

Born and educated at Grand Island, Nebraska, Dr. Starr received advanced degrees in chemistry from Iowa State College at Ames. For the past ten years he has been employed as a chemist by the United States Bureau of Entomology and Plant Quarantine abroad and at the Beltsville Experiment Station. Recently he has specialized in chemical problems related to methods of formulating and applying DDT and he will continue similar work with Penick.

FORREST KNOX lately of Roanoke, Virginia, is now affiliated with the Biltmore Exterminating Company of Atlanta, and also announces the opening of a branch office in the Chattanooga Bank Building.

JIM STECKEL, son of "Doc" Steckel, past president of the NPCA, plays fullback on the Kiski Preparatory School football team. Like father, like son — "Doc" too played in his younger days.

ROSE EXTERMINATOR CO.

Annual meeting of the branch managers of the Rose Exterminator Co. was held October 24, 25 at the Netherland Plaza, Cincinnati, Ohio, following close of the NPCA Board of Directors meeting. Policies for year were discussed.

Two new offices were represented by George W. Brockmeyer of San Antonio and George W. Dyar of Hartford.

Other managers in attendance: Lester West, Boston; Wm. Shrimplin, N. Y.; York King, Philadelphia; Joseph Laughlin, Pittsburgh; Harlem Ives, Detroit; A. M. Akers, Cleveland; Gerald Clem, St. Louis; Harry Lewis, Buffalo; Robert Yeager, Cincinnati; Harry and Fred York, Atlanta; Edwin L. Marsh, Pasadena; C. Walter Porter, Baltimore; C. Norman Dold, Chicago.

WPB DIES NOV. 3—The War Production Board went out of existence Nov. 3 under the terms of an executive order signed on Oct. 4 by President Truman. A Civilian Production Administration has been set up to wind up the affairs of WPB.

THE LACK of a cutoff dash and omission of the customary "Born" head made readers of the Bellefontaine (O.) Examiner wonder whom the newspaper was kidding when an item about DDT was run under the machine cap line, "Oh, Boy!" and right beneath it appeared a birth notice.

This DDT had a strange effect on the copy reader of the Louisville (Ky.) Courier Journal, who wrote: "Miami to Count Rats on Fleas in DDT Test."

SOME strange and interesting things have been happening in the press under the influence of the new insecticide, DDT. For instance, there was the headline in the Dallas (Tex.) Times Herald which read:

What's Buzzin', Cousin? "It Ain't Me,' Says Fly Who Got Shot of DDT

EXAGGERATED STATEMENTS about DDT in current advertising have led to a number of complaints being made to the Better Business Bureau of New York City, it was reported on October 15. In its investigations of advertisements, the bureau said, it has found two kinds of misleading statements, namely, the overemphasis of DDT in labels and copy, suggesting that it is the principal ingredient in an insecticide; and the claim, expressed or implied, that DDT will kill all insect pests.

TOJO'S JAIL—Omori prison camp, that Nippon pest hole, has been cleaned up with DDT powder, and General Tojo and other high-toned Jap war criminals have moved in, according to the N. Y. Times. To deverminate it now will call for a stronger kind of powder.

DELOUSING MACHINE DEVELOPED—A power driven delousing outfit capable of dusting 600 persons an hour has been developed, and more than 1,600 procured by the Quartermaster Corps, the War Department has announced. The outfit is extremely compact, measuring 24 inches by 24 inches by 30 inches, weighing, without dust guns or hoses, approximately 180 pounds.

POWDERS CONTAINING ROTENONE—Activation, oxidation and subsequent degradation of powders containing rotenone are reported greatly accelerated by the addition of minor amounts of inert nonvolatile liquid. Oxidation is greatly decelerated by small amounts of oxalic, phosphoric, sulphamic, or other strong acids.

—*Inside News.*

LABELING COMMITTEE FORMED—Three industrial trade associations—Agricultural Insecticide and Fungicide Association, Manufacturing Chemists' Association and National Association of Insecticide and Disinfectant Manufacturers—have formed a joint committee to consider the labeling and technical problems involved in DDT formulations. AIF representatives on this committee are Louis Gemmell of American Cyanamid & Chemical Corp., and Sanford J. Hill of E. I. duPont de Nemours & Co., Inc.

"DUST CYCLONE" TAMED—A man-made cyclone is now being used to help farmers and ranchers combat the bugs and insects that attack their crops.

The machine, known as the cyclone duster, creates a controlled wind velocity of 185 miles per hour at point of discharge on a single unit. This is greater than the average speed of a hurricane or cyclone, which is rated at 150 miles an hour. The duster is produced by the Niagara Sprayer and Chemical Company, Inc., of Middleport, N. Y.

DDT RIVALS—Technical Army officers in Germany have been ransacking files and studying plants to find out what was done during the war in chemistry. Among other facts it was established that though DDT was made in large amounts in Germany other insecticides were also developed. An entirely new approach was marked by "Lauseto neu," a chemical identified as

Now 40% GREATER DISCHARGE CAPACITY

IDEAL *Rechargeable*
Flashlight STORAGE BATTERY

NOW IMPROVED!

This increased discharge capacity means:—MUCH BRIGHTER, LONGER SUSTAINED LIGHT—smaller voltage drop assuring TOP LEVEL-LIGHT VOLUME—Even greater flashlight satisfaction than already experienced by MANY THOUSANDS OF USERS—can OUTLAST 400 or more DRY CELLS—SAVES up to $10 on each flashlight. Fits standard flashlight case using 2 or more 1¼" size D dry cells.

GUARANTEED!

IDEAL Battery Chargers in single, 6-gang and 12-gang types, plug into any light socket. Also rechargeable from automobile ignition line.

PROMPT DELIVERY Write for Bulletin BB 5

IDEAL Sycamore

Storage Battery Division
IDEAL COMMUTATOR DRESSER CO.
5208 Park Ave., Sycamore, Ill.
Sales offices in all principal cities
In Canada: Irving Smith Ltd., Montreal, Quebec

VEGEX DRY GRAVY

RATS CAN'T RESIST THE NEW BAIT
as effective as the best beef

Simply add water—boil up once—add poison—and it works like magic. Keeps indefinitely—needs no refrigeration. Safe to use.

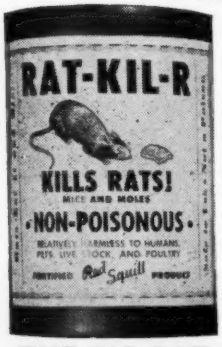
One five-pound package makes five-gallon mixture—costs only four dollars. Four five-pound packages—fifteen dollars. Available in five-pound packages only.

VEGEX COMPANY
175 FIFTH AVENUE **NEW YORK 10, N. Y.**

You can sell ANYTHING ONCE . . .
BUT—RAT-KIL-R—Repeats and REPEATS!

RAT-KIL-R

KING OF RED SQUILL BAITS
• NON-POISONOUS •



- Clean Dry Pellets
- 6 Different Flavors
- Contains Real Fish Meat
- Always Fresh—Ready to Use

Add RAT-KIL-R to Your Line.

Use or Sell Under Your Own Name—As You Like.

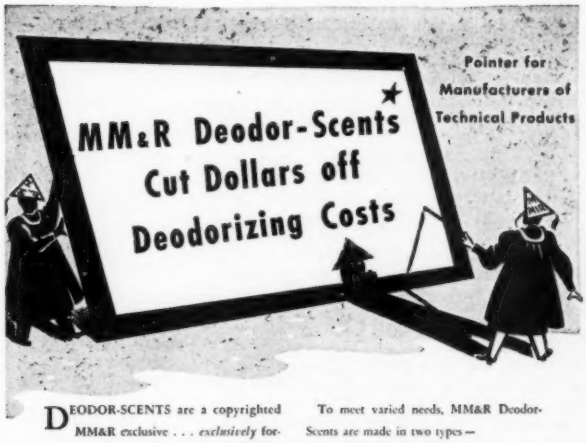
We Ship a Pound or a Ton in Bulk or Package.

THE BIG RAT BAIT MONEY MAKER!
USED AND SOLD BY EXTERMINATORS THROUGHOUT U. S. A.

MAIL POST CARD FOR SAMPLE AND PRICES

AMERICAN WORLD CHEMICAL CO.
411 North 10th St. St. Louis, Mo.

These Products Will Also Make You Money
- FLY-KIL CONCENTRATE
- ROACH-KIL CONCENTRATE
- INDUSTRIAL DISINFECTANT
- TERMITE-KIL CONCENTRATE
- INSEC-GAS FUMIGANT
- SAF-UZE ROACH POWDER



DEODOR-SCENTS are a copyrighted MM&R exclusive . . . *exclusively* formulated to cover the odors of ingredients used in fly sprays and other technical products.

With MM&R Deodor-Scents, every trace of undesirable odor is removed positively and permanently, and at a cost so low you'll marvel at their extraordinary efficiency.

To meet varied needs, MM&R Deodor-Scents are made in two types—

Type A—*To Neutralize and Perfume*
Type B—*To Neutralize Without Perfuming*

If possible, send us your unperfumed product, and we will return "Deodor-Scented" samples. Deodor-Scents for testing on request.

**It's not a Deodor-Scent if it's not labeled MM&R*

Magnus Means Reliability

MAGNUS, MABEE & REYNARD, INC.
SINCE 1895 ONE OF THE WORLD'S GREATEST SUPPLIERS OF ESSENTIAL OILS
16 DESBROSSES STREET, NEW YORK CITY • 221 NORTH LA SALLE STREET, CHICAGO
Los Angeles: Braun Corp. • Seattle, Portland, Spokane: Van Waters & Rogers, Inc.
San Francisco: Braun-Knecht-Heimann Co. • Canada: Richardson Agencies, Ltd., Toronto

chloromethyl 4 chlorophenyl sulfone and said to be more active than DDT against the body louse and bedbugs but less so against flies. A mixture of chlorophenyl sulfone 3, 4 dichlorobenzyl alcohol was even more active against bedbugs. Another compound, "Lucex," is not as effective as DDT but cheaper. It is made by chlorinating the side chain of ethyl chlorobenzene.

THE MONTH'S GAG—Edgar Bergen: "Don't you know, Charley, that there is a lesson in the ant? He works hard, perseveres and accomplishes something. And as a result—"

Charley McCarthy: "He is stepped on."

Bergen: "No, not that!"

McCarthy: "Then DDT gets him."

CLAIRE TREVOR BALKS AT TERMITES IN HOUSE—Hollywood (UP)—Film Actress Claire Trevor filed suit in Superior Court to recover $22,614 placed in escrow for purchase of a home she claimed has termites.

The suit was filed against Jacob M. Heimann, who last month asked the court to approve the sale and give him a judgment. Miss Trevor succeeded in having the court uphold a demurrer to Heimann's suit and he has two weeks to file a corrected complaint.

Miss Trevor said she changed her mind about buying the Beverly Hills home from Heimann and wants the sale voided because, she said, the place has termites.

SWARMS OF BUTTERFLIES SOAR IN FROM OCEAN—San Francisco (AP)—Thousands upon thousands of colorful butterflies, tentatively identified as migrating monarchs of the Pacific Northwest, flew in from the ocean and filled the air at the Cliff House, to the amazement of swimmers and promenaders.

A witness said the flights came straight from the sea. The Academy of Natural Sciences surmised that the butterflies were blown off their course from the Pacific Northwest by strong north winds which have fanned ravaging fires in Northern California.

EXPLODING INSECTICIDE DUST—Explosives for applying insecticide dust have been used in England using a mortar of rolled, cemented paper, enclosing the dust in a paper lining and a powder charge. Parks, forests and orchards can be dusted at moderate cost compared with present methods.

—*Inside News.*

FUTURE OF AEROSOL—The aerosol bomb evidently is not expected by DDT authorities to fit into the civilian insecticide picture. Costs, which never dismay military branches, might prove a formidable obstacle despite the efficiency obtainable with Freon gas as propellant. Later this difficulty may be removed.

Aerosol composition consists of 85% Freon, 2% of a 20% pyrethrum solution, 3% DDT, 5% cyclohexanone, and 5% lubricating oil. This is given as the current Army formula for killing mosquitoes and disease-bearing flies. Earlier formulas mentioned sesame instead of "lubricating oil", because of its synergistic qualities. Some of the commercial flysprays being planned for the market contain no sesame.

Canadian and other varieties of talc have been stimulated by insecticidal demands and other industrial needs. Pyrophyllite, required in DDT dusting mixtures, has been in a tight supply position. Dimethyl phthalate, reflecting military demands and the stringent supply situation in all phthalates, is loosening somewhat and should find increased use shortly in commercial insect repellent preparations.

—*Chem. and Eng. News.*

REPORT ON DDT RESULTS

Philadelphia Official Says Flies Were Driven From Stables

Philadelphia, Sept. 29—Reporting on the results of DDT experiments made in the local police stables and lowlands of Delaware County, Dr. Rufus S. Reeves, director of the Department of Health, revealed that the new insecticide was fatal to flies indoors, but not so effective on flies and mosquitoes outdoors.

At the police stables the immediate result was the disappearance of flies in great numbers," Dr. Reeves stated. In the outdoor test against flies and fly larvae and pupae the results were negative.

The spraying of DDT with a fogging machine in Delaware County showed only a one-night reduction in the number of adult mosquitoes, Dr. Reeves Reported.

—*N. Y. Herald-Tribune.*

THE SENSE OF SMELL in bloodhounds, bedbugs, snakes and sharks is in the range of the subject matter of Charles V. Sparhawk's **What's the Truth About Odor,** in The American Perfumer, August 1945. We do not really smell with our nose, but with our brain, and if a part of our brain is injured, the sense of smell is affected. Odors are linked up with associations, frequently going back to childhood, and our likes and dislikes are often motivated by events long forgotten.

KEEP GARBAGE FROM RATS, CITY URGES HOUSEKEEPERS

Food and garbage must be kept away from rats before there can be an effective rat-control program, it was agreed on October 20 at a conference of the Cincinnati, (Ohio) Board of Health with Robert G. Sarvis, Public Works Director, and Ralph C. Taylor, Superintendent of Waste Collection.

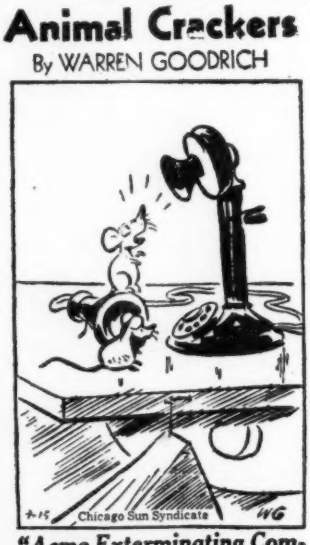
The board asked Dr. Carl A. Wilzbach, Health Commissioner, to appeal to the public to cooperate in the rat-control program by following these recommendations.

(1)—See that all garbage is drained and wrapped properly.

(2)—Avoid overloading cans, necessitating pounding in order to remove the garbage.

(3)—Keep lids on cans at all times.

(4)—Do not throw food upon the ground for birds. Put it on a platform at least four feet above the ground.



"Acme Exterminating Company? We're bothered with people in this house."

—Courtesy of The Chicago Sun

INFORMATION WANTED

Tampa.—To Mrs. H. A. Dunn: I'm sure we would all be glad to eliminate the pests but if all the DDT is like the bottle I got, put up by a local firm, we are doomed for disappointment. I sprayed the walls until each room was misty and closed them for 20 minutes. Yet that same night I still had mosquitoes and roaches. If your bottle really did the work please let us have the name for I know several besides myself that would appreciate it.

Mrs. A. Yates.

—*From Tampla (Fla.) Tribune.*

ALBERT LEA, MINN. (AP)—Ralph Booen, 60, went into his basement to see if a new gas system he had devised to exterminate rats was working properly.

Later firemen carried him from the basement, revived him, and agreed that the system was working fine.

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RAT GLUE AND BOARDS CIRCULAR

RAT GLUE AND BOARDS CIRCULAR discusses use of rat glue boards as a means for effective rat control, etc.

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TERRATOX CONCENTRATES

Circular depicts damage by termites, Lyctus Beetles and decay and the value of Terratox Concentrates as a means of control. Price list also included.

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Manufacturer's literature states this squill rat paste has been found very successful in the control of rats and other members of the rodent family. It is also claimed that this rat paste can be spread in all degrees of ordinary temperature and that it will stick tight to the bait. For manufacturer's prices and complete literature write:

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SAFETY IN FUMIGATION WORK

Fumigation Safety Rule No. 1; namely, "Vacate entire building even though only part is fumigated, as well as adjoining buildings into which gas may penetrate" is discussed in this bulletin.

WRITE American Cyanamid & Chemical Co., 30 Rockefeller Plaza, N. Y. 20, N. Y. for copy of Bulletin No. 78.

NEW ANIMAL TRAP CATALOG

Prominent manufacturer of rat traps has issued a new and interesting catalog on "How to Catch More Fur." It contains instructions on how to catch more fur. Dramatic stories of pioneer trappers as well as hints and kinks for outdoorsmen. A copy may be had by writing J. T. Boone, c/o Animal Trap Co. of America, Lititz, Pa.

GRAIN FUMIGANT

The Pennsylvania Salt Manufacturing Company has just issued an attractive booklet on Penco Grain Fumigant, which it states, is an economical, effective, easily applied fumigant for control of insects attacking stored grain and that it is manufactured under rigid laboratory control. The formula itself is based, the booklet further advises, upon recommendations of the U. S. Department of Agriculture. Packaged in 5-gallon and 55-gallon non-returnable steel drums.

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SIX TOXICANTS

Release describes six different types of toxicants, combinations of a type of Thanite and DDT on DDT, described in this bulletin.

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RHothane D3 and DDT IN INSECTICIDAL FORMULATIONS

This bulletin presents properties of both RHothane D3 and DDT, together with information regarding the formulation of household and livestock sprays based on RHothane and DDT, or on combinations of these with Lethane 384 and Lethane 384 Special and the formulation of other insecticidal compositions.

WRITE ROHM & HAAS CO., W. Wash. Sq., Philadelphia, Pa.

DDT FORMULATIONS BULLETIN DISCUSSES

Heavy metal sheet for termite shields; wire mesh for spreading discoids; carpet beetles and spirea; rat depredations; Cytox DDT formulations, DDT dust concentrate, and 40% DDT wettable powder.

Write American Cyanimid & Chem. Co., 30 Rockefeller Plaza, New York 20, N. Y., for Bulletin No. 94.

FUMIGATORS EXAMINATION

Analysis of examination papers from a written examination taken by a number of PCO's and others who attended a school on insect and rodent control are contained in this news bulletin. Bulletin also publishes a list of questions people ask PCO's about Cyanogas and the answers thereto.

WRITE American Cyanamid & Chemical Co., 30 Rockefeller Plaza, N. Y. 20, N. Y. for copy of Bulletin No. 91.

THE MODERN TREATMENT OF CYANIDE POISONING

This brochure, written by KK. Chen, M. D., Charles L. Rose, B.A., and G. H. A. Clowes, Sc.D., and reprinted from the Journal of the Indiana State Medical Association, discusses The Modern Treatment of Cyanide Poisoning. Contents include: Sources of Poisoning and Mortality Statistics; Diagnosis; The New Treatment; A Suggested Procedure for Actual Treatment; Results to Date, etc.

WRITE American Cyanamid & Chemical Co., 30 Rockefeller Plaza, N. Y. 20, N. Y. for copy of Cyanide.

CONTROL OF TERMITES-POWDER-POST (LYCTUS) BEETLES-DECAY

Circular discusses properties and uses of Permatox A in termite control and its application to soil and wood to control termites, decay control, powder-post beetle prevention and control. Description of Permatox T and its uses in termite control, as a soil poison, are also discussed, together with toxicity.

WRITE PESTS—BULLETIN 43-T.

VICTOR GLADIATOR METAL RAT TRAP

The Victor Gladiator Rat Trap is made of 22 Gauge Steel, Gun Metal finish. Equipped with strong double-coil spring made of 15 gauge oil tempered spring wire, heavy wire work throughout. Note holes in base for nailing to floor, rafters, or wall.

The Victor Gladiator has been designed especially for professional use by public health officers, sanitary officers of the armed forces, and pest control operators. It is of rugged construction and is particularly adapted to outdoor use; especially recommended for the tropics and on shipboard, not readily affected by continuous contact with moisture.

Actual size 7⅛x3⅝x1½". Weight, packed 1 dozen, 4½ lbs. Weight, packed 6 dozen, 29½ lbs.

WRITE PESTS—VICTOR.

POWCO BRAND
REG. U.S. PAT. OFF.

D.D.T. (Dichloro-Diphenyl-Trichloroethane) For the manufacture of household and agricultural insecticides compounded to safely obtain the results which buyers expect.

PYRETHRUM Concentrated pyrethrum extracts of high stability containing 20% Pyrethrins and higher.

PYRIN A super Pyrin containing the quick action and safety of Pyrethrum that produces insecticides of better than double A quality.

NH DUST A nitrated hydrocarbon derivative; an effective insecticide for crawling insects that has quick action and "drive out".

PYRISCENTS Powco Pyriscents hide "difficult to cover" ingredients without reducing toxicity of the spray.

JOHN POWELL & CO.
114 East 32nd Street,
New York City.

For your jobs requiring
Non-Poisonous Bait—Sell and Use

Quirk's QUICK DEATH RAT KILLER

EFFECTIVE

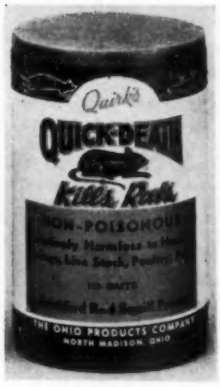
Paper Wrapped Baits
New Fortified Red Squill
Guaranteed Killing Power

SAFE

Non-Poisonous
Can be used where food is stored
Relatively harmless to humans, pets, poultry, other animals

CONVENIENT

Ready-To-Use
Non-Deteriorating
Nothing to Mix
100 Baits to Can



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Attractive Discounts to PCO's
We Pay Shipping Charges

THE OHIO PRODUCTS CO.
NORTH MADISON OHIO

KILL MOTHS and LARVAE

with

SOLVAY
TRADE MARK REG. U. S. PAT. OFF.
PARA-DICHLOROBENZENE

Para-dichlorobenzene, properly used, is recommended by the U. S. Dept. of Agriculture as an actual moth killer.

Kills moth larvae and also deodorizes as it prevents moth damage.

Write for complete folder containing simple, easy-to-follow instructions. Prices for 100 and 200 lb. drums on request. Write today to Dept. GA-12.

SOLVAY SALES CORPORATION
Alkalies and Chemical Products Manufactured by The Solvay Process Company
40 Rector Street **New York 6, N. Y.**

"TOX-EOL" 12½ TO 1 SUPER CONCENTRATE

NOW AVAILABLE WITHOUT PRIORITIES

FOR TERMITE CONTROL

Chlorinated Phenol Toxic Base, which has been effectively used for many years by the larger Termite Control Operators from Coast to Coast in the "TOX-EOL SYSTEM" of Termite Control.

This new super strong CONCENTRATE may be diluted with 12½ parts Fuel Oil, Kerosene, or even Crank Case drainings to make the proper strength (over 5%) treating solution.

"TOX-EOL" 12½ CONCENTRATE means lower transportation charges, fewer containers—lower chemical cost. Now costs less than creosote.

FOR WOOD OR SOIL TREATMENT

Write for our plan of dealer co-operation and 5 year Warranty.

CRE-O-TOX CHEMICAL PRODUCTS COMPANY

Pioneers in the use of Chlorinated Phenols for termite control.

MADISON AT WILLETT **MEMPHIS 4, TENNESSEE**

INSECT TRAPS

Bulletins describe traps for ants and roaches, with suggestions for their use.
WRITE PESTS—SOILICIDE.

PRESERVATION OF MILLWORK AND OTHER DRY WOOD PRODUCTS

Bulletin discusses composition of Permatox B Concentrate and its application in the preservation of millwork and other dry wood products.
WRITE PESTS—PERMATOX 43-B.

ANT BAIT

Circular describes a jelly ant bait with Thallium Sulphate as its toxic ingredient. Comes packed in sizes convenient for resale or professional use. Sample tube on request.
WRITE PESTS—LETHELIN.

FUMIGATION SAFETY RULE

A review of fumigation accidents of record for 1943 shows that oversight or disregard of rule to lock all doors and accessible windows, failure to place warning signs thereon and failure to post guard during fumigation account for approximately 20% of the accidents. Bulletin discusses ways and means to eliminate accidents of this nature.
WRITE American Cyanamid & Chemical Co., 30 Rockefeller Plaza, N. Y. 20, N. Y. for copy of Bulletin No. 80.

Fortified Red Squill circular, which includes bait chart, describes a Fortified Red Squill powder activated and standardized to meet recommendations of the Fish & Wildlife Service for a minimum lethal dose of 500/600 mg/kg of rat.
WRITE PESTS—PRENTISS.

SODIUM SILICO FLUORIDE

Bulletin describes sodium silico fluoride product with proper density. Effective manner of testing for presence of HCN after ventilation also discussed.
WRITE American Cyanamid & Chemical Co., 30 Rockefeller Plaza, N. Y. 20, N. Y. for copy of Bulletin No. 70.

Fumigation manual. 76-page manual describes safe handling and working with "Cyanegg" and on fumigation procedure and insect control. Illustrated.
WRITE PESTS—DuPONT.

GAS MASKS—RAT CONTROL PROGRAMS

Bulletin offers some pertinent suggestions regarding gas masks and how to keep them in perfect condition. It also discusses rat control programs and what the PCO can do to further them.
WRITE American Cyanamid & Chemical Co., 30 Rockefeller Plaza, N. Y. 20, N. Y. for copy of Bulletin No. 82.

INDUSTRIAL CHEMICALS AND SPECIALTIES

This descriptive booklet lists the industrial chemicals and specialties manufactured by the Pennsylvania Salt Mfg. Co., which include DDT, grain fumigant, household and industrial sprays, etc.
WRITE PESTS—Pennsylvania.

FUMIGATOR'S FIRST AID KIT

Now available for purchase by the PCO is a fumigator's first aid kit containing a cyanide antidote. Every PCO who engages in cyanide fumigation should have a sufficient number of these kits so that he can have one on each job—ready for the physician in case of emergency. Then, if anything happens, the man on the job immediately starts the Schafer Prone Pressure Method on the patient while someone else puts in a call for the physician. Thus, when the physician arrives, the kit is at his immediate disposal.
WRITE American Cyanamid & Chemical Co., 30 Rockefeller Plaza, N. Y. 20, N. Y. for copy of Bulletin No. 93.

Inquiries invited from pest control operators interested in New Big 6 Line of Wizo Moth Killer Vaporizers and Crystals. Catalog describing each product fully and prices available.
WRITE PESTS—ELKAY.

FILM OF VALUE TO PCO

Circular describes a vivid action film of greatest value to every PCO and opportunities it affords PCO to build good will and better public relations.
WRITE PESTS—WIL-KIL.

Phosphorous Paste killing power; baits, combinations, amounts for the control of roaches, mice, rats are discussed.
WRITE PESTS—OPITZ.

METHYL BROMIDE FOR INFESTATION CONTROL

Reprint of an article by J. Carl Dawson which discusses insect control in the flour mill and warehouse with methyl bromide. Illustrated.
WRITE PESTS—DAWSON.

FOR EXTERMINATING RATS AND MICE

Circular describes prepared Red Squill baits, which, it is stated, will save time of your service men and is economical to use. . . . Information also furnished on strychnine-treated, anise-scented mouse seed.
WRITE PESTS—Ce-Co.

METHYL BROMIDE APPLICATORS AND SUPPLEMENTARY EQUIPMENT

Profusely illustrated this booklet describes applicators for one-pound cans of methyl bromide; applicators for use with cylinders; application of methyl bromide by direct weighing of cylinders; tubing and piping; piping system for mill and warehouse; sealing materials; fans; tarpaulins; safety equipment; Halide Leak Detector; safety suggestions, etc.
WRITE PESTS—APPLICATORS.

Red Squill Rat and Mouse Killer

Booklet describes Red Squill rat and mouse killer made up in convenient package form for resale to public. Also illustrated are resale packages of dog repellent, moth killer, etc. Included in the booklet is reprint of an article on Red Squill by Leonard R. Parkinson, Agr. Exp. Station, Massachusetts State College.
WRITE PESTS—OHIO.

CALCIUM CYANIDE FOR RAT CONTROL

36-page booklet contains excerpts from official publications and reports of health officers throughout the world regarding use of calcium cyanide in the control of rats. The widely differing conditions surrounding infestations, and the specific types of control for each, which are described, will serve as suggestions to health officers and others in solving similar problems.
WRITE PESTS.

THE ACTIVATING EFECT OF PYRETHRUM UPON THE GERMAN COCKROACH

Research material prepared by John M. Hutzel, of the Ohio State University, Columbus, Ohio in cooperation with the Kenya Pyrethrum Extension Service, Inc., N. Y. Supervised by Professor F. L. Campbell.
WRITE PESTS—PYRETHRUM.

INSECT POISONING AGENTS

"Thanite, quick death to insects" is a 12-page booklet presented in Basic English with a view to international use. It discusses the development and applications of the product.
WRITE PESTS—HERCULES.

ELECTRIC FANS HAVE SEVERAL USEFUL FUNCTIONS IN FUMIGATION WORK

Ways in which fans may be used to promote circulation and penetration of gas during fumigation are described in this bulletin.
WRITE American Cyanamid & Chemical Co., 30 Rockefeller Plaza, N. Y. 20, N. Y. for copy of Bulletin No. 84.

BIRD REPELLENT

Circular describes product which manufacturer claims will serve as an effective repellent against pigeons, starlings, bats, dogs, cats, rats, mice, woodchucks, moles as well as crawling and flying insects that prey upon plantings and seedlings.
WRITE PESTS—PX.

BOX CAR FUMIGATION

Folder describes box car fumigation with methyl bromide, giving details as to: car seal, applicator arrangement, methyl bromide application, dosage, exposure period, temperature, aeration, precautions.
WRITE PESTS—DOW.

PRESERVATION OF LUMBER, POLES, POSTS, PLYWOOD WITH PENTACHLORPHENOL

This bulletin gives a brief summary of the properties, use to date, and recommendations for the preservative treatment of lumber, poles, posts, and other forest products with Permatox A. This product, it is stated, has shown outstanding promise as an effective and permanent oil preservative for many wood products. Set forth briefly also, are recommendations for the effective preservative treatment of lumber, poles, posts, and other forest products with Permatox A, based upon experience to date.
WRITE PESTS—BULLETIN 43-A.

NEW ANT TRAP

Manufacturer claims many new features such as no turning or twisting necessary; four openings; larger trap; contents ½ greater than any other competitive brand.
WRITE FOR YOUR FREE SAMPLE OF ANT TRAP TO NOTT, c/o PESTS.

WOOD PRESERVATIVES

Discussed are several products for the control of decay, blue stain, termites, powder post beetles, swelling, warping, checking, shrinking, moisture absorption, grain raising. Illustrated.
WRITE PESTS—PRESERVATIVES (W).

PIGEON-PROOFING

Folder describes pigeon-proofing invention which manufacturer claims will completely and decisively eliminate the pigeon nuisance. In use by real estate companies, churches, government buildings, etc.
WRITE PESTS—STANLEY.

FIRST AID AND TREATMENT FOR METHYL BROMIDE EXPOSURE

This valuable booklet, prepared by Dr. H. H. Gay, Medical Director, The Dow Chemical Company, Midland, Mich., outlines first aid and treatment for Methyl Bromide exposures. Contents are based upon what is believed to be sound medical practice. Digest follows: properties of Methyl Bromide, symptoms of Methyl Bromide exposure, first aid, suggested treatment by a physician, skin contacts with Methyl Bromide. Copy may be had by writing Dow direct, or
WRITE PESTS—GAY.

ALL-PLASTIC GOGGLE

Circular describes a new lightweight, all-plastic goggle which provides comfortable, durable protection for the eyes. The individual eye cups are moulded to fit the facial contours, giving a close yet comfortable seal around eye orbits, according to the circular. Particularly useful for spraying in termite control, as well as heavier bedbug spraying operations, to prevent direct sprays from getting into the eyes themselves—available in different models.
WRITE PESTS—MINE.

RESPONSE OF RATS MAINTAINED ON DIETS FUMIGATED WITH METHYL BROMIDE

Research material reprinted from Food Research
WRITE PESTS—DOW-RESEARCH.

FUMIGATION SAFETY RULE

Bulletin discusses importance of personal inspection of entire premises immediately before releasing gas, and offers some constructive suggestions with respect thereto.
WRITE American Cyanamid & Chemical Co., 30 Rockefeller Plaza, N. Y. 20, N. Y. for copy of Bulletin No. 81.

STERILIZING GAS MASKS

News bulletin describes a chemical that is claimed by the manufacturer to be effective in sterilization of gas masks. Bulletin also discusses antidotes and first aid, particularly an inhalant which functions

Business Opportunities

(Classified)

RATES — For individuals seeking employment, 5c per word, minimum $1.00. All others 10c per word, minimum, $2.00. All advertisements must be in the hands of the publishers seven days before publication date and must be accompanied by cash or money order for payment in full. The publishers are not responsible for any false or misleading advertisements.

Replies to advertisements where box number only is indicated should be addressed c/o PESTS, 1200 Oak St., Kansas City 6, Mo., giving box number as well.

WANTED—Three experienced pest control Service Men. State age, experience and education. Box 3.

ENTOMOLOGIST WANTED with pest control experience. State age, qualifications and education. Box 1.

FOR SALE—Pest Control business in Western Pennsylvania section. Well established. Selling account of moving west for health. Write Box 5.

MANAGER — Complete knowledge of service and sales. New York or Connecticut territory. Large, reputable firm. $4,000 per year plus percentage of profits to right party. All letters held in strict confidence. Box 200.

FOR SALE—Established pest control business. Full equipment, formulas, good volume yearly contract service accounts, compact territory, good reasons for selling now. PESTS—Box 9.

Additional Patents Relating to Pest Control

By DR. R. C. ROARK.

2,379,723 (July 3, 1945; appl. Feb. 7, 1944). PARASITICIDAL PREPARATIONS. Elbert C. Ladd, Passaic, N. J.—United States Rubber Company, New York, N. Y., a corporation of New Jersey.—An insect repellent composition comprises a carrier and N-nitrosophthalimidine as an active ingredient.

2,380,061 (July 10, 1945; appl. Sept. 27, 1943). CYANOMETHYL ESTERS OF DICARBOXYLIC ACIDS. David T. Mowry, Dayton, Ohio—Monsanto Chemical Co., St. Louis, Mo.—The patentee claims bis(cyanomethyl) fumarate, mesaconate, and alpha-chlorofumarate. These serve as insecticides and fungicides or as intermediates in the preparation of materials having insecticidal, fungicidal, rot-proofing and water-proofing properties.

2,380,063 (July 10, 1945; appl. Sept. 27, 1943). CYANOMETHYL CINNAMATES. David T. Mowry, Dayton, Ohio—Monsanto Chemical Co., St. Louis, Mo.—Examples are cyanomethyl cinnamate and cyanomethyl alpha-methylcinnamate.

2,380,127 (July 10, 1945; appl. May 10, 1944). TRAP. Earl Hicks Tomey, Detroit, Mich.—A mouse trap is described.

A GOOD JOB DONE

PER-MO-BITS

Scientifically Prepared For

RATS-MICE-MOLES

Made with tested Red Squill

A product that is effective, dependable and ready to use.

Safe to use—non-poisonous to humans, pets, domestic animals, etc.

A try sample size for $1.00—send for one today.

Packed 8 oz., 16 oz. or bulk.

4 to 1 Concentrate FOR RATS AND MICE

(Just Dilute With Water)

Per-Mo Rat and Mice Liquid can be used as a drink or can be mixed with any food and used as a bait.

ECONOMICAL TO USE

Send $1.00 for a 16-oz. Bottle CONCENTRATE RAT & MICE LIQUID. Postage Prepaid.

PENETRATE—

YOUR TERRITORY WITH THE

MOTHPROOF LIQUID THAT "PENETRATES"

Now that woolen conservation is so vital to "UNCLE SAM'S" war program, there is still greater need for Moth protection. You can help "America" protect its valuable woolen materials by selling "PER-MO" Moth-proofing Service. Full particulars and prices first letter.

Per-Mo. Mothproof Company

3604 Woodland Ave. Kansas City 3, Mo.

HANDBOOK OF PEST CONTROL

The Behavior, Life History and Control of Household Pests

By ARNOLD MALLIS

This new book is a thoroughly practical, complete and up-to-date study of pest control which will be invaluable to every insecticide manufacturer, pest control operator and entomologist. Approximately 570 pages in length, and containing 140 illustrations, it deals in a practical way with the behavior, life history and control of household pests.

While there have been other books in this field, Mr. Mallis' book is by far the most complete and up-to-the-minute practical text on the subject. It reflects insecticide developments as recent as those of the past few months, carrying for instance, the most recent findings on DDT, aerosol insecticides, insect repellents, etc. The emphasis throughout is on control measures, and the author covers fully all the commonly used insecticide materials and treatments. Fumigation is the subject of a special chapter.

An unusually complete list of references to the literature on household pests, insecticides and their use adds considerably to the value of Mr. Mallis' new book. Hundreds of references to the technical literature are listed.

TABLE OF CONTENTS

Chapter		Chapter	
1	Rats and Mice	14	Ants
2	Silverfish	15	Bees and Wasps
3	Springtails	16	Stored Product Pests
4	Cockroaches	17	Spider or Ptinid Beetles
5	Crickets	18	Lice
6	Earwigs	19	Fleas
7	Termites	20	Flies and Mosquitoes
8	Dry Rot Fungi	21	Spiders
9	Wood-boring, Book-boring and Related Beetles	22	Mites
		23	Ticks
10	Psocids	24	Miscellaneous Household Pests
11	Bedbugs and Other Bugs	25	Chemicals Used in Controlling Household Pests
12	Clothes Moths		
13	Hide and Carpet Beetles	26	Household Fumigation

HANDBOOK OF PEST CONTROL has standard high-grade book binding, cloth and board covers, 6 x 9. Priced at $6.00 per copy. Check **must accompany** order. Owing to present conditions, the first edition must be limited. Accordingly, an **early order** accompanied by check is suggested.

Pests.....$6.00, Plus Postage

CENTROBULBS

The Favorite Bellows with PCO's Everywhere

Better than pre-war.

Bulb made of synthetic rubber.

Works better, lasts longer, snappier.

Oil and grease resisting.

Perfect invisible seams.

Nozzle made of heavy die-cast metal with cut threads.

Large opening for quick refilling.

Made to form-fit hand of pest control operator.

In dozen lots or more of a size

12 Oz.	$9.00 doz.
8 Oz.	7.20 doz.
4 Oz.	3.00 doz.

F. O. B. New York

Central Rubber Products Co., Inc.

821 Broadway New York 3, N. Y.

best as an antidote to HCN poisoning, and where obtainable.

WRITE American Cyanamid & Chemical Co., 30 Rockefeller Plaza, N. Y. 20, N. Y. for copy of Bulletin No. 73.

FUMIGATION SAFETY SUGGESTIONS

Of timely interest, in view of the at-hand fumigation season, is this bulletin which advocates as a safety measure the use of methyl orange-mercuric chloride test papers for the presence of HCN. It also discusses can openers for Zyklon Discoids, the need for adequate ventilation after fumigations, and gives a cautionary note on pilot lights in premises to be fumigated.

WRITE PESTS—AMERICAN.

TERMITE CONTROL

Folder discusses concentrates available for two distinct methods of termite control: (1) treatment of timbers in place with an oil solution, and (2) treatment of all soil around an infested building or area with either an oil or water soluble chemical. Issuing company states it specializes in all problems concerning wood-destroying organisms and also wood preservation and invites your inquiries thereto.

WRITE PESTS—WOOD.

MILITARY FUMIGATION MANUAL

This special 48-page manual has been prepared for the benefit of officers and civilians in the Armed Forces who are responsible for vermin control, and for PCO's who may contract with the Armed Forces for fumigating work. Among other subjects, the manual discusses: dosage, preparation of building for fumigation, fumigation operation, common pests, cockroach control; precautions, first aid methods, etc.

WRITE American Cyanamid & Chemical Co., 30 Rockefeller Plaza, N. Y. 20, N. Y. for copy of Bulletin.

SYNTHETIC ROACH POWDERS

Research material apropos thiocyanates in powdered form for roach control in place of pyrethrum—describes the development and properties of roach, ant and bedbug powder based on Lethane A-70.

WRITE PESTS—SYNTHETIC.

SPECIAL ROACH POWDER

Circular describes a roach powder (containing Lethane A 70) which, it is stated, is fast acting, positive in kill and will not deteriorate for at least eight weeks after application. As a result, the supplier points out, the PCO does not have to service his customers as often, thereby conserving manpower. Moreover, it is stated, the powder is non-toxic to warm-blooded animals and may, therefore, be used in dairies, packing and food handling plants, homes, etc., in fact, in all places where sodium fluoride mixtures may not be used. . . . Described also is a sodium fluoride-Pyrane formulation for the PCO who wishes to make his own roach powder.

WRITE PESTS—BOSLEY.

LETHANE A-70

Folder discusses roach, ant and bedbug powders based on this new insecticide concentrate. Described are: safety factors, cost per application, killing power, performance data, residual activity, tenacity, etc.

WRITE PESTS—A-70.

SOLVAY PRODUCTS

48-page booklet in colors and illustrated, covering their entire line of Alkalies and Special Products, with a special section dealing with Para-Dichlorobenzene and Ortho-Dichlorobenzene.

FREE COPY MAY BE HAD BY PEST CONTROL OPERATORS.

WRITE PESTS—SOLVAY, c/o PESTS.

NEW RAT BAIT

The current difficulty of procuring rat baits because of meat rationing has been overcome by the discovery on the part of numerous PCO's of Vegex Dry Gravy, states its manufacturer.

This product with a delicious meat flavor, and high in hydrolized vegetable protein seems to be an irresistible lure for rats, according to the same source.

It has many advantages. It is instantly prepared by simply adding water and boiling up once.

The prepared bait can be handily carried in the kit, and the bait need never be touched, as bread can be dipped in the poison mixture by tongs. Keeps indefinitely and needs no refrigeration, it is stated.

Results with Vegex Dry Gravy have been so good in rodenticide work, and the Gravy is so inexpensive and easily handled that PCO's who have used it are expecting, according to the supplier, to continue even after war rationing is a thing of the past.

The Vegex Company, located at 175 Fifth Avenue, New York 10, N. Y., puts up this Dry Gravy in 5-pound packages only. One 5-pound package makes 5 gallons of finished Gravy. Prices and other pertinent data on Vegex Rat Bait may be had by writing the company.

TREATMENT FOR BURNS

Circular outlines following qualities of Hydrosulphosol Ointment for industrial first aid burn treatments:

1. Relieves pain quickly.
2. Pressure dressing.
3. Non-caking—readily removed.
4. Controls infection.
5. Accelerates healing.
6. Non-toxic—safe.

WRITE PESTS—DAVIS.

DEODORANT

Catalog includes price data, etc., on deodorant which it is felt can neutralize and deodorize such toxic agents as Thanite, Lethane 384 Special, Velsicol, etc. Also contains data on perfume oils for sprays made with pyrethrum and kerosene.

WRITE PESTS—MAGNUS.

METHYL BROMIDE

What it is; what it does; how to use it—all these questions apropos methyl bromide are covered in an instructive and informative brochure. Described are dosage schedule for various type pests, methods of application and preliminary precautionary measures.

WRITE PESTS—Westvaco.

ALABAMA OPERATES STATE-WIDE RAT CONTROL PROGRAM TO STOP SPREAD OF TYPHUS FEVER

An article written by Dr. Andrew J. Perolio, State Director of Typhus Control of the State of Alabama which describes the State's program for stopping the spread of typhus fever.

WRITE American Cyanamid & Chemical Co., 30 Rockefeller Plaza, N. Y. 20, N. Y. for copy of Bulletin.

Hydrocyanic Acid Poisoning—Skin Absorption

Bulletin discusses some pertinent safety suggestions with respect to avoidance of hydrocyanic acid poisoning through skin absorption.

WRITE American Cyanamid & Chemical Co., 30 Rockefeller Plaza, N. Y. 20, N. Y. for copy of Bulletin No. 74.

CONTINUOUS INTIMATE BLENDING

A bulletin on the intimate blending of fine chemical, food and insecticide powders has recently been issued by Sprout, Waldron & Company, Manufacturing Engineers. In addition to a description of Blending Systems designed for continuous, automatic operation, there is a page of photographs which show the difference between intimate blending and conventional mixing as revealed by typical spatula tests. Copies of this 8-page bulletin in two colors may be obtained from PESTS—SPROUT.

REMOVAL OF PHOTOGRAPHIC FILMS AND PAPERS BEFORE FUMIGATION

is the title of an interesting and informative Bulletin which discusses the effects of hydrocyanic acid vapors upon unexposed photographic film. Other subjects discussed are: "High Temperature Necessary for Winter Fumigation"; "The Rat Menace—An Opportunity to Cooperate."

WRITE American Cyanamid & Chemical Co., 30 Rockefeller Plaza, N. Y. 20, N. Y. for copy of Bulletin No. 88.

INSECT COLLECTIONS

Booklet describes pocket display case which may slip easily into a coat pocket making it of value for salesmen or others who travel about. Life history collections of structural type pests are also available for the PCO.

WRITE PESTS—WARD'S.

EFFECT OF HYDROCYANIC ACID ON FOODSTUFFS

This bulletin answers some highly interesting questions as to the effect of HCN on foodstuffs.

WRITE American Cyanamid & Chemical Co., 30 Rockefeller Plaza, N. Y. 20, N. Y. for copy of Bulletin No. 89.

THALLIUM PRODUCTS

Circular calls attention to ant traps and jelly bait for control of ants—house or garden; mice seeds, rat paste, etc.

WRITE PESTS—NOTT.

RESPIRATOR

Bulletin discusses "Clear-Vue" model Dustfoe Respirator, which it is stated is durable, odorless, noncorrosive and a non-conductor of electricity and heat and gives a proved protection against toxic dusts.

WRITE PESTS—DUSTFOE.

HYDROCYANIC GAS MASK

Bulletin describes Hydrocyanic gas mask with all-vision facepiece.

WRITE PESTS—MINE.

NEW PERFUMING PRINCIPLE FOR INSECT SPRAY TOXIC AGENTS

Perfume Oil Fruit Berry MM&R is called the first new and different neutralizer-perfume in a decade, by Magnus, Mabee & Reynard, Inc., New York essential oil house.

Perfume Oil Fruit Berry MM&R not only neutralizes the odor of toxic agents, but imparts a truly refreshing fragrance of uncommonly light character. It has a definite fruity scent. A remarkable feature is that it has so light a fragrance, yet has the hiding power to give lasting coverage of heavy odors. This feature will be of particular interest for sprays used in food plants, bakeries, etc.

Fragrance of sprays, up to now one of the unmentionables of insect toxicants, now becomes an asset instead of a liability. Samples may be had by writing PESTS—MABEE.

DDT IS POISONOUS

An article by Herbert O. Calvery, Food and Drug Administration, which discusses tolerance level deemed necessary when it is used on human food.

WRITE PEST—POWELL (C).

NEW RECHARGEABLE FLASHLIGHT BATTERY

Forty per cent greater capacity and higher sustained bright light is claimed for a new improved model Rechargeable Flashlight Battery announced by the IDEAL Commutator Dresser Co.

The present Battery is the result of several years of intensive research stimulated by the success already obtained from previous models now in service.

Originally introduced five years ago, this type of Battery has played an important part during the war which caused a scarcity of dry cells.

The IDEAL Battery, it is stated, may be charged from any AC Electrical outlet by means of a rectifier type charger or from the DC ignition system of automobile, truck or bus.

Where flashlights are used regularly, the rechargeable feature of the Storage Battery is said to provide greater economy and brighter, sustained light.

WRITE PESTS—IDEAL.

MOTH DAMAGE PREVENTIVE

Leaflet discusses value of para-dichlorobenzene in moth control, directions in using, and its value as a deodorant. WRITE PESTS—SOLVAY (M).

EDUCATE THE DOCTOR IN FUMIGATION FIRST AID PROCEDURE

Is the title of this instructive Fumigation News Bulletin, which lists some constructive ways in which the PCO can help the doctor to prevent fumigation fatalities. Also discussed are: Fumigation Chamber Fumigation Prospects, Wholesale Grocers.

WRITE American Cyanamid & Chemical Co., 30 Rockefeller Plaza, N. Y. 20, N. Y. for copy of Bulletin No. 92.

RED SQUILL FOR RAT CONTROL

An informative brochure on the value of red squill in control of rats, mice; its effect on domestic animals and man.

Also discussed are bait procedure, pre-baiting, and use of red squill in extended rat programs, attractants, research in rat-food selection, etc.

WRITE PESTS—PENICK.

ELECTRIC FANS

Bulletin discusses value of electric fans in connection with fumigation work, also some pertinent thoughts on the Schafer Prone Pressure Method of Resuscitation, etc.

WRITE PESTS—AC-69.

Advantage of low dosage fumigation at frequent intervals—warehouses and factories—is discussed in this bulletin. Inadvisability of fumigating cold houses also reviewed.

WRITE American Cyanamid & Chemical Co., 30 Rockefeller Plaza, N. Y. 20, N. Y. for copy of Bulletin No. 69.

ANIMAL ODORS AS REPELLENTS AND ATTRACTANTS

Incorporation of the glandular extraction of the skunk into commercial repellents to add to their potency and efficacy is discussed in an interesting article, entitled "The Odor of an Enemy, the Cat Frightens Mice Away," by Charles V. Sparhawk. In it he also discusses the use of a small quantity of muskrat bait in the form of a gland as a powerful attraction to any creature that feeds on meat, such as mosquitoes, flies, ticks, lice, rats and mice, etc.

WRITE PESTS—SPARHAWK.

NH DUST

Leaflet describes new organic insecticide compound which, it is stated, may be used where non-poisonous insecticides are mandatory. Effective against roaches, silverfish, ants, fleas, lice and many other common pests found in the home, industrial and food storage plants.

WRITE PESTS—POWELL.

FUMIGATION SAFETY RULES

Bulletin discusses fumigation safety rules with respect to mattresses, pillows, bedding, clothing and bedroom rugs, etc.

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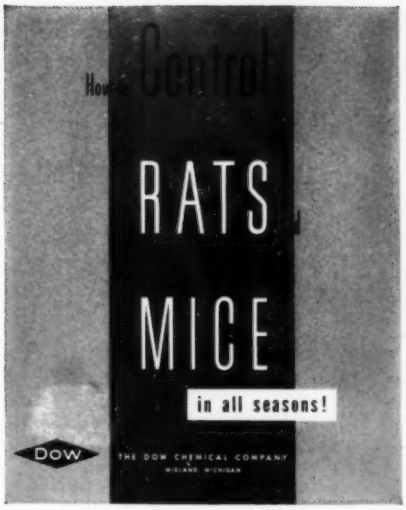

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